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Meaning of Life.

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THE MEANING OF LIFE

AS SHOWN IN THE PROCESS
OF EVOLUTION

BY

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"MIND AND MATTER," "THE FUTURE OF LIFE," ETC.

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*It should be clearly understood that each writer in this series of little books
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I

Theism, Materialism, and Idealism

THERE are, I think, broadly four different kinds of beliefs which are commonly entertained to-day about the nature of the universe. They are : (1) that the universe is the creation of an omnipotent, benevolent God ; (2) that it is material, and that nothing exists except matter and the emanations from matter ; (3) that matter is an illusion, and that life, or, as some philosophers prefer to say, mind, alone exists ; (4) that the universe contains life and matter (and other things different both from life and matter, as well), life and matter being ultimate principles, neither of which can be resolved into the other.

These beliefs are susceptible of endless variations, and are in fact held in a great number of different forms. Nevertheless, I think that all the varieties of religious creed, of metaphysical system, and of scientific hypothesis will be found on analysis to reduce themselves to one or other of these four main types of belief. The object of this book is to state and to defend the fourth of these beliefs. It will be necessary, however, first to say something with regard to the other three, and, so far as (2) and (3) are concerned, to give briefly our reasons for rejecting them.

(1) The Universe as the Creation of an Omnipotent, Benevolent God.

The arguments both for and against this belief are well known and need not be recapitulated here. I propose, therefore, to content myself with saying that the arguments against seem to me to be convincing, and not to trespass further on this well-worn territory.

(2) The Universe as Material.

This view is commonly thought to be in accordance with the teachings of science, and is accordingly popular among Rationalists. It was in the nineteenth century that science first became a formidable adversary of religion, and those who wished to discredit the orthodox Christian view equipped them-

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selves for controversy with the Church with weapons drawn from the armoury of contemporary science. As nineteenth-century science was predominantly Materialistic in tendency, those who advocated the claims of reason and experiment against those of revelation and authority found themselves committed to a Materialist view of the universe. If there was no God, then, they held, there was not and could not be mind or spirit of any kind. There were only matter and the emanations from matter.

The definition of Materialism as the view that the universe is or consists of matter and the emanations from matter is not likely to pass unchallenged. In recent years it has become customary among Rationalists to lay stress upon the mechanistic aspect of Materialism by demonstrating the strict determinism to which all cosmic events are subject, rather than upon the specifically material character of the events whose activities are determined. Thus we find Mr. Chapman Cohen, in a recent book entitled *Materialism Restated*, naming the view that "the state of the world, or of any portion of it, at any given time, is the exact consequence of the distribution and conjunction of the forces preceding that moment" as the distinguishing feature of Materialism. "The essence of Materialism," he says again, "lies in the simple statement that every phenomenon in the universe is the consequent of a composition of natural forces."

The significance of a definition of this type turns very largely upon the meaning of the word "natural." What, we want to know, are "natural" forces? Presumably those which govern the movements of natural objects. What are natural objects? Natural objects are, in the widest significance of the term, merely those objects which exist. Hence the definition becomes "the objects that exist are the consequence of a composition of the forces that exist." This, no doubt, is true, but not illuminating. Mr. Cohen, we feel, must mean more than this. In order, then, to extract a more definite meaning from what must otherwise run the risk of seeming a mere tautology, let us inquire what is the nature of the objects which exist—what, in short, are natural objects?

They are either all material (however matter be defined), or else there are some which are material and some which are not. Those which are not will differ not merely in point of quantity from those which are, since such a difference would involve merely an increase or a decrease in the sum-total of matter in the universe; they must be different also in point of quality.

Now, to that which is different in point of quality from matter—to life or mind, for example (if they are, in fact, different), we have no reason to suppose that the laws which govern the behaviour of matter will apply. It is not merely a case of saying, as many Materialists do: “It is quite true that there are many phenomena which we cannot yet interpret in terms of physics or chemistry, but that is merely due to our present deficiency of knowledge. Many phenomena, the explanation of whose occurrence in terms of material causation was unknown two hundred years ago, have now through the advance of science been successfully brought within the realm of physical and chemical law; hence we may suppose that a further advance in scientific knowledge will exhibit the phenomena at present unexplained—as, for example, the mental operations involved in doing a mathematical sum—in the same light.” It does not avail, I say, to use this argument, because it assumes that the phenomena at present unexplained in terms of physics and chemistry are ultimately of the same *type* as those which are susceptible of physical and chemical explanation—an assumption which begs the whole question at issue. Certainly we have no right to assume that they are, merely because *some* phenomena have been shown in the past to obey physical and chemical laws.

Yet this is precisely the assumption that Mr. Cohen makes. “There is not a scientist in the world,” he tells us approvingly (though erroneously), “who, if looking for the cause of psychological facts, would not seek it in chemical and physical ones. To think of the former in the absence of the latter is a sheer impossibility”; while he insists that “the explanation” (of facts at present unexplained) “whenever found will be along mechanistic or *materialistic* lines.” And Mr. Cohen makes this assumption and insists on this proposition about the nature of the explanation of facts at present unexplained, inadvertently dropping into the use of old-fashioned words like “*materialistic*,” which give the whole game away, because, in spite of his disclaimer, he *does* believe that matter, however it be defined, and the emanations from matter, constitute the sole form of existence in the universe. Because of this belief, when he comes to deal with vital or mental phenomena, he assumes without question that they “have their roots in phenomena that are not mental,” and takes it for granted that, even if they could be proved to have *originated* in this way, as to which it is, I imagine, quite certain that they could not, the demonstration would simultaneously convict them of being not

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fundamentally different in their present nature from what they were in their first beginnings, as if the proof that the embryo of Einstein was once a fish, and that Einstein himself still possesses the rudiments of gills, constituted a reason for supposing that a complete account of Einstein and of the mind of Einstein could be given in terms of the physiology of fishes now.

I conclude, therefore, that, disguise it as he may by talk of the composition of forces in the name of mechanistic determinism, deny it as he does in the interests of subjective Idealism,¹ Mr. Chapman Cohen is still an unrepentant Materialist, believing, as the older Materialists believed, that matter is the only form of existence in the universe; convinced, therefore, that life and mind sprang or emerged from matter in the past; and prepared to contend that they are not fundamentally different in their nature from matter now. I shall assume, then, that Materialists who are both honest and clear-headed do, in fact, still hold this belief, and what I have to say about Materialism will be based upon this assumption.

What we have to consider, then, is the view that the universe consists exclusively of matter and of the emanations from matter, and that its behaviour, including the behaviour of what is called mind, could in theory be adequately described in terms of the laws of physics. One of the chief merits of this view is its simplicity. This is all to the good, since we have space for only the briefest recapitulation of its main features.

Nineteenth-century Materialism was derived from two main sources—biology and psychology. In biology Darwin had shown that the development of life upon the earth, from the first specks of protoplasmic jelly floating in the intertidal scum of the Palaeozoic seas right up to the appearance of the nineteenth-century scientist, was a continuous process. For

¹ This remark is based upon the surprising fact that, in his eagerness to deny that Materialists believe in matter and in nothing but matter, Mr. Cohen commits himself to an analysis of perception according to which the only possible objects of our knowledge are our own conscious states. This point of view is of course familiar, though apparently not to Mr. Cohen, as that of subjective Idealism. It is logically irrefutable, but it leads not to Materialism, but to the view that mind alone is real and matter an illusion. It also leads to the view that the self and its conscious states are the only things that exist in the universe. In his anxiety to disclaim the charge of being a crude Materialist, Mr. Cohen has unwittingly declared himself a Solipsist. He is alone in a universe of his own making, lacking the solace and companionship even of matter. This is to jump out of the frying-pan into the fire with a vengeance.

reasons unknown, variations in species occurred. Given the variation, factors such as the struggle for existence, resulting in the survival of the fittest, determined whether it should be eliminated or established, and settled its future history. In other words, the influence of the environment—I am using the word in its widest sense—upon the living organism decided its survival and dictated its development if it survived. With each generation that passed, the variation, if remaining subject to the same influences, became more marked, until ultimately it became sufficiently differentiated from the original stock to justify us in saying that a new species had evolved. Some, following Lamarck, held that the influence of the environment was sufficient to account for the appearance of the variation, creatures adapting themselves automatically to changes in the environment as the changes occurred, or perishing through failure of adaptation. In either case the upshot was the same. In order to account for the development which began with the amoeba and culminated in man, it was necessary to invoke neither purpose nor design, neither creative God nor evolutionary spiritual force; it was sufficient merely to understand the laws in accordance with which organisms reacted to their environment.

And these laws were ultimately the laws of physics; the laws, that is to say, that govern the movement of bits of matter. Indeed, living organisms properly regarded are nothing but complicated bits of matter of a refined type. This further conclusion was established by psychology, which, realising the difficulty of interaction between two entirely distinct substances such as mind and matter were commonly conceived to be, solved it by bluntly denying the difference. The mind was not different from the body, but merely a very rarefied form of it surrounding the brain, much as a halo surrounds the head of a saint. Its function was to register or illuminate events occurring in the brain; when the illumination took place we were said to be conscious of the events. Clearly the mind could not register what was not there, hence nothing could happen in the mind unless it first happened in the body.

Later Materialism dispenses with the halo, and regards the mind merely as an aspect or function of the brain, the brain being conceived as a mechanism for transforming bodily events into mental ones. "The mind," declares Sir Arthur Keith, "has a material basis. The brain is a piece of living machinery. It consumes fuel, and transmits energy into feeling, thought,

and memory." The upshot is the same : mind action is determined by brain action, because it is nothing more than brain action, and psychology is ultimately a department of physiology. Combine this result with the biologists' conclusion that nothing can happen in the body except as a reaction to stimulus either immediate or delayed from the external environment—except, that is to say, as the result of some prior happening outside the body—and the circle of physical causation is complete. The body reflects, and is determined by the external environment; the brain reflects, and is determined by the body; the mind is a function or aspect of the brain. Thus the mind, a late and unimportant development in the evolution of matter, divested of spontaneity and initiative, is reduced to the rôle of spectator of the course of material events.

Geology and astronomy reinforced this conclusion. Geology had enormously extended the age of the world, astronomy the size and spread of space; and in the vast immensities of geological time and astronomical space life seemed like a tiny glow flickering uncertainly, and ultimately doomed to extinction. On all sides the brutal and the material conditioned and determined the apparently spiritual and vital; and life, an unimportant passenger travelling across a fundamentally alien environment, will one day finish its pointless journey with as little éclat as in the person of the amoeba it began it.

Thus Materialism explains everything in terms of different arrangements and constructions of bits of matter. Little bits of matter wandering aimlessly in space have produced our hopes and fears, the scent of the rose, the colour of the sunset, and the mystic's experience of God. They have produced life, an incidental product, thrown up haphazard in the course of their wandering; and they have produced mind, which is our knowledge of the little bits. Mind, then, is merely the consciousness of the bits by themselves.

To emphasize the discouraging implications of this view for the prospects of humanity is needless. Humanity, in fact, is doomed in advance. There was a time when our planet was not suitable for mankind; it was too hot and too moist. A time will come when it will cease to be suitable; it will be too cold and too dry. When the sun goes out, a catastrophe that is bound to be, mankind will long ago have disappeared. The last inhabitants of the earth will be as destitute, as feeble, and as dull-witted as the first. They will have forgotten all the arts and all the sciences. They will huddle wretchedly in caves alongside glaciers that will roll their transparent masses

over the half-obliterated ruins of the cities where men now think and love, suffer and hope. The last desperate survivors of mankind will know nothing of our achievements in the present; nothing of aspirations for the future. One day the last of them, callous alike to hate and love, will exhale to the unfriendly sky the final human breath, and the globe will go rolling on, bearing with it through the silent fields of space the ashes of humanity, the poems of Homer, and the remnants of the Greek marbles frozen beneath its icy surface.

Meanwhile free-will is destroyed by the omnipresence of matter, as effectively as it is precluded by the omnipotence and omniscience of God. Mind, as we have already pointed out, cannot initiate action on its own account; it can only automatically register the events occurring in the body of which it forms part. To say that you saw blue devils in a nightmare because you failed to digest your supper, or that you enjoyed a celestial vision in the course of which you conversed with God and His angels because you had been inhaling nitrous-dioxide gas, is to give an adequate and concise summary of the function of mind, if the Materialist view is the true one. Where mind is determined by body, and body by the external stimuli to which it reacts, it is clear that Ethics, with all that it implies of the possibility of improvement by the exercise of effort and will, goes by the board. The structure of Ethics is built upon the twin pillars of praise and blame; and praise and blame presuppose at least some measure of responsibility on the part of the person to whom they are applied. To praise a man for acting rightly implies that he might have acted otherwise, and deserves credit for not doing so; to blame him for acting wrongly implies equally that he ought not to have done, and was free not to do, what he did. Yet, if his actions are not willed but are determined, then freedom to choose the good and to eschew the bad is denied to him as effectively as the intelligence to conceive, the will to struggle, the capacity to endure, and the ability to develop through the exercise of his own efforts.

It is important, then, if the conceptions of right and wrong, of progress and development, are not to be dismissed as idle words, that we should be able to refute the psychological view which convicts them of futility.

(3) *The Evidence against Materialism.*

To consider adequately the evidence which has accumulated in recent years to throw doubt upon the Materialist view

would take us far beyond the scope of the present booklet. Nor is it a task which the present writer is fitted to undertake. This is not a confession of humility, but simply an acknowledgment of the fact that, as the evidence in question belongs to several different departments of science, no scientist is competent to deal with more than the one aspect of it in which he happens to be a specialist. That the philosopher, being a specialist in no department, is not competent to deal with the evidence at all is an obvious retort, which nevertheless rests upon a misunderstanding of the function of philosophy. Philosophy is a clearing-house in which the conclusions of science are pooled. Accepted without cavil as valid within their proper sphere, they may yet be subjected to criticism and interpretation in so far as they lay claim to validity outside it. To correlate conclusions arrived at by independent lines of investigation is often to reach results which could not have been deduced from any of them taken in isolation. The philosopher takes a bird's-eye view of the whole territory whose separate areas the scientist systematically explores, and in so doing catches sight of the wood to which the scientist has been blinded by the proximity of his many separate trees. Although, therefore, we cannot do more than refer in the briefest possible way to the evidence in question, we shall be able to select it impartially from a number of different spheres, and, seeing it as a whole, to appraise its significance for our view of the universe as a whole.

(i) *The Origin of Variations*.—Beginning with biology, we will content ourselves with pointing out two considerations. First, though the factors emphasized by Darwin guide the course and ultimately determine the survival of variations once they have appeared, they do not account for their appearance. Yet it is to their appearance that the whole process of evolution is due. If all offspring exactly reproduced the characteristics of their parents, the world would still be populated by amœbas. How, then, and why do species vary? Biologists trace the origin of the characteristics that organisms exhibit to the arrangement of the genes along the chromosomes in the germ cells derived from the parents. But the laws determining this arrangement are not known. Furthermore, there is no reason to suppose that the genes, which are packets of chemicals, although quite certainly determining some of the characteristics of the organism, necessarily determine all; that, in other words, the difference between Shakespeare and an idiot could ultimately be reduced to differences in the

number and arrangement of the genes which formed their respective physiological inheritances. The belief that all vital characters can be derived from the initial characteristics of the initial germinal depends, in short, for its plausibility upon the Materialist theory being true, and cannot therefore be invoked to prove that theory. Even if all the properties exhibited by the adult organism could be expressed in terms of combinations of the initial germinal material, we are still ignorant of the cause of these combinations. Meanwhile biologists confess themselves unable to explain the origin of the variations to which the development of new species is admittedly due; "with all recognition of the work and thought above summarized," say Professors Thomson and Geddes, "we cannot but think that the secret of variability lies yet deeper, in the very nature of the living organism itself. It has been a Proteus from the first; changefulness is its most abiding quality; in short, the essence of the creature is its innate creativeness." Until they can do so, we are entitled at least to affirm that there is nothing in the evidence to justify the assertion that the Materialist hypothesis provides an adequate explanation of the appearance of new characters, and hence of the origin of new species, while the absence of an adequate Materialist explanation suggests the presupposition that matter is not the only factor to be reckoned with. The conclusion is that, while material factors, such as the influence of environment, undoubtedly account, at least in part, for the history of the variation once it has appeared, they seem unable to explain its appearance.

What is more—and here we come to our second consideration—they totally fail to explain the admitted fact that the process of evolution still continues. For consider: one of the classic principles invoked by Materialists to account for changes in species is the principle of adaptation to environment. As the environment varies so does the organism, being prompted by the stimuli it receives to achieve an ever more perfect degree of adaptation until adjustment is perfect, and complete equilibrium between the creature and its environment is established. Now, equilibrium means physical equilibrium, since, on the view that we are considering, only material factors are involved. Why, then, it may be asked, does life still develop? Why does evolution go on, and go on to complicate our structure so unnecessarily that, instead of becoming more fitted to our physical environment than we used to be, we are less? A degree of adaptation which, from the purely physical point of

view, would put the average human being to shame has been achieved by living organisms thousands of years ago. Human complacency rarely permits us to realize how ridiculously ill equipped for the purposes of physical existence the species "man," and in particular that variety of the species known as "civilized man," is. He cannot keep himself warm without covering himself with the skins of other animals; he is the prey of innumerable diseases; his body is unnecessarily complicated, and his young are completely helpless over an abnormally long period. He is exceptionally destructive; he is irritable and mischievous, and alone among living creatures he kills members of his own species whom he does not require for purposes of sustenance. Compared with the average elephant or tortoise, which is longer lived, beset by few and simple diseases, and protected against the chances of its environment by an adequate covering, man, considered as a physical organism, is markedly inferior.

The inference is irresistible, that the achievement by life of mere adaptation is not enough, but that living beings are evolved at more complicated and therefore more dangerous levels, in the endeavour to attain *higher* forms of life. The amœba, in short, is superseded by the man, not because the man is better-adapted life, but because he is better-quality life. In making this inference, however, we are admitting the suggestion that evolution is not a haphazard but a purposive process—an admission which is incompatible with Materialism.

(ii) *The Mind as a Function of the Brain*.—The questions raised by the psychological issue are unfortunately technical in character, and I cannot do more than mention one or two of the more obvious difficulties that the Materialist theory has to meet.

Briefly, the question at issue is whether the facts of our mental and emotional life, the experiences we undoubtedly have in thinking, willing, hoping, desiring, and so forth, require us to postulate the existence of anything additional to the nervous system and the brain. For the Materialist they do not. For him there is merely the body, and the brain which is the most sensitive part of the body; and what we call mind, spirit, or soul is, to use a metaphor of Sir Arthur Keith's, a manifestation of the living brain, just as the flame is the manifestation of a burning candle. The contrary view is that, though the brain is intimately bound up with the mind, though they are constantly interacting with and influencing each other, nevertheless a complete account of mind activity cannot

and never can be given in terms of brain activity, for the reason that the mind is more than the brain. Not only is it more than, but it is in a sense superior to, the brain—a controlling directive force that makes use of the brain as its instrument, playing upon it as the hands of a skilled pianist play upon the notes of a piano.

Let us assume provisionally that the first view is correct. The mind, then, is the brain, or, as some Materialists put it, a function of the brain. Now, the brain is part of the body, and the body is material. It follows that the laws which determine the workings of the mind are ultimately such as hold in the world of matter. Of these the law of cause and effect is one; in fact, it is all-pervasive.¹ There cannot, that is to say, according to the Materialist view, be a change or modification in a bit of matter except as the effect of a preceding change or modification in that bit of matter or in another; this will be true also of changes in the body. Translating this into the language of physiology, we may say that there can be no event in the body except in response to some stimulus, whether external to the body as in the case of a plateful of dinner determining mouth-watering in a hungry man, or internal, as where a bad liver causes a yellow face. Cases of internal stimulus will always in the long run be reducible to external stimulation. If we wanted to know what was the cause of the bad liver, we should probably find it in curry and the Indian climate. What is true of bodily causation will also be true, if mind be part of or a function of the body, of mind causation. Mental events also will be in the nature of responses to stimuli. These stimuli will be material, and they must also precede the events which they determine.

Proceeding on these assumptions, let us consider the case of foresight or expectation. I am sitting in my chair after dinner and thinking, let us say, of a lecture I am to give next week. The thought of it makes me nervous and apprehensive, causing me to feel restless, to fidget, get up out of my chair, and start pacing the room. Here, then, are bodily events which, to a common-sense view, would appear to be caused by a mental event. We think, we would say in ordinary conversation, of next week's lecture, and the thought makes us feel nervous. But for the Materialist this account is untenable. For him

¹ Or, at least, it is so regarded by Materialists, although the whole conception of material causation as implying the exercise of compulsion by one bit of matter over another has recently been modified. Some Materialists are aware of this, most are not.

bodily events must precede mental ones; and bodily events, he insists, occur only as the result of a preceding stimulus. What, then, is the stimulus here? Clearly it must be a material stimulus, since, on the view we are considering, matter alone exists; and clearly also it must be a happening in the present, since the body cannot be influenced by what happens in the future. Future matter, in fact, does not exist. Yet the only external stimulus of which I am aware is the pressure of the chair against my back and legs; there is also an internal stimulus in the form of events occurring in my body in connection with the digestion of my dinner. To say that these stimuli determine states of the body and brain, of which the psychological interpretation is thinking of next week's lecture, seems fantastic, especially when it is borne in mind that the lecture taken as a set of events in the material world does not yet exist. Yet it is precisely this that we are compelled to say if, insisting that the mind is material, we hold that mental events can occur only as the result of material causes.

If there is a mind which is not matter, it is at least conceivable that it should be able to think of, and so to be influenced by, future events, which, at the time at which they are thought of, are themselves as yet non-existent in the world of matter. Foresight and expectation, though remarkable, are not *as spontaneous mental characteristics* incredible. But if matter alone exists, and mind therefore is matter, then it can respond only to present changes in other bits of matter; and thoughts of future events—thoughts, moreover, which, as in the case given, produce present changes in the matter of the body—seem inexplicable.

The expectation of future events is by no means the only type of mental activity which raises difficulties for the view we are considering. For example, there is our apprehension of meaning; there are the activities involved in doing arithmetic, or there is telepathy. All these provide instances of mental processes, which seem to evade description in terms of bodily processes. As, however, this is not a treatise on psychology, I must content myself with referring the reader elsewhere for an account of them.¹

The conclusion to which examples of this type point is that, in addition to the brain, the composition of the living organism includes an immaterial element which we call mind; that this element, although acting in close association with the brain, is

¹ See, for example, my little book, "The Mind and its Workings," Chapter III., in Benn's Sixpenny Series.

nevertheless more than a mere register for the noting or reflecting of cerebral events; that it can on occasion itself direct and control the material constituents of the brain and body, using them to carry out its purposes in relation to the external world, much as a driver will use the mechanism of his motor car; and that, so far from being determined and caused by events in the body, it can itself constitute the cause of bodily events, so that a dread of a coming ordeal which makes me break into a sweat of nervous apprehension may be accounted a *bona fide* case of mind activity influencing bodily activity, without being itself the effect of preceding bodily activity. The brain is a marvellously complicated piece of mechanism, about whose working we still know very little; so little, indeed, that it is not possible to tell by an inspection of cerebral tissue the difference between the brains of an Einstein and of an idiot. Both alike, judged merely as mechanisms, may be compared to telephone exchanges for the reception and transmission of messages. But if the brain is a telephone exchange, we still require a something to send the messages, since, when this something is withdrawn, the activity of the exchange ceases, though its structure remains unimpaired. It is to this something that we give the name of mind, and the sending of messages to the body is the activity of mind. The relation of this mind activity to the vital force expressing itself in the process of evolution, to the existence of which our brief survey of biological considerations seemed to point, will be considered later. It is, in fact, the main subject of this book.

(iii) *The Modern Conception of Matter*.—It is, however, not so much to biology or psychology as to physics itself that we must turn for the evidence which of recent years has carried the most disturbing implications for Materialism. The domination of Materialism in the nineteenth century was no mere historical accident; it was intimately bound up with the current conception of matter. Nineteenth-century matter was something concrete, fixed, and definite. Lacking the elusiveness of mind, it lay out there in space, a hard tangible something, forming an admirable basis for the irrefragable convictions of the man of horse sense. That this is no longer the position has become so evident that the twentieth-century preference for working in terms of mind rather than of matter is, from some points of view, little more than a preference for explaining phenomena in terms of the more rather than of the less known. Matter has disintegrated under our very eyes. Relativity informs us that position in time is as much a feature

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of its make-up as position in space, with the corollary that, since its position in time is different at each moment, a piece of matter is not a solid entity enduring through time, but, like a portrait on the cinema screen, a series of momentary existences which only their resemblances to one another justify us in collecting together as appearances of the same thing. A similar result emerges from the theory of the atom. Atoms, it seems, are not indestructible; electrons and protons can meet and annihilate one another, while their persistence, such as it is, is rather that of a wave lacking fixed boundaries, and in process of continual change both as regards shape and position, than that of a thing. Thus the principle of conservation of substance, so far at least as matter is concerned, no longer holds, and the phenomenon of radio-activity has rendered it dubious in respect of energy.

Or again we may think, with Eddington, of the external world simply as a series of events possessed only of mathematical qualities, position in space-time, order, sequence, and so forth. Matter is merely a mathematical characteristic of the relations between logical structures of these events. The events fall, or, as some prefer to put it, are arranged by mind, into certain definite patterns. These patterns of events form the basis of the world we know, being worked up by the mind into the material objects of every-day life. It is the mind, that is to say, that bestows upon the patterns of events the secondary qualities of colour, shape, smell, and so forth. Hence, as Professor Whitehead has pointed out, the poets are mistaken in the objects of their admiration. Their congratulatory odes should be addressed not to nature, but to themselves; for all the qualities they admire—the song of the nightingale, the scent of the rose, the colours of the sunset—are the work of the human mind. Nature herself is a dull and arid affair without scent, sound, or colour, consisting of the endless, pointless movement of material particles. The conclusion is that the world we know is in a very real sense mind-created. Something, no doubt, is given from outside, but it is little more than a clean slate for our minds to work on, and the writing we discern is what we ourselves have put there. Creatures with minds differently constructed—Martians, for instance—might either select different patterns from the spatio-temporal flux, or, even if the patterns are given and not imposed by the activity of mind, might work them up differently. In either event their world of matter would be different from our own.

These possibilities have long been familiar to the philosopher. It is only in recent years that they have received the countenance of science. So sponsored, they are or should be matter for serious concern to the Materialist. So far from mind being relegated to a position of unimportance as an incidental product of matter, its position is, it would seem, fundamental. It is in a very real sense the artificer of the world we know, its intervention being demanded from the outset as a condition of the world appearing to us as it does. And, since matter is the aspect under which the external world presents itself, we may go further and say that mind is constitutive of matter.

I say that the Materialist should be concerned by these possibilities; but honesty compels me to admit that on the whole he is not, and, so far as the considerations hitherto enumerated are concerned, I am not sure that his recalcitrance is not justified. Faced with them, he avers that the precise analysis of matter does not interest him. Science has produced fresh formulæ for matter at the rate of about one every ten years for the last fifty years, and he is quite ready to accept the one that is most fashionable at the moment. Whether the ultimate constituents of matter are hard little enduring balls, as Dalton supposed, or whether matter be exhibited as the product of humps in space-time, or of vortices in the ether, he does not mind; he is content to let the scientist settle these things for him. What does concern him is to prove that these ultimate constituents of the universe, whatever they may be, can be shown to be capable of producing, by the automatic operations of natural law, all the phenomena that we know. And so, by these modern theories of matter, his withers remain on the whole unwrung. If solid matter is no longer fashionable, he is quite content to call the ultimate something which lies at the bases of the material universe X, and leave it at that. And, as I said above, his attitude would seem at first sight to be justified. Almost, but not quite. For, though it may be true that relativity theory leaves his withers justifiably unwrung, there are nevertheless indications in the modern theory of the atom that it is no longer possible to call it X and leave it at that, as if what X is did not matter.

Of these indications I will mention two, both of which arise from the behaviour of that mysterious entity, the electron. In the first place, then, it turns out that we never know an atom at all. What we know are the effects that the atom produces in its neighbourhood when it changes. These changes are, broadly speaking, of two kinds, and result in the absorption

or radiation of energy by the atom. The atom absorbs energy from without when an electron jumps from an inner to an outer orbit; it radiates energy when an electron jumps from an outer to an inner orbit, or, in the case of the heavier atoms, when it emits rays of light in radio-activity.

But these changes are not known directly. What we observe are the effects produced by their occurrence on the surrounding field. These effects increase in intensity as we approach nearer and nearer to the place where the atom is, and then suddenly they cease. The place where they stop is the place where the atom is. Hence the atom itself is the one thing we do not know; when we reach it our knowledge ceases.

Our knowledge of the atom, to use a simile of Mr. Bertrand Russell's, is like the knowledge of a ticket collector who is permanently on duty at the station of a town. He knows anything about what is happening in the town only when somebody enters it or leaves it: his knowledge of the town is limited to observation of its visitors; the town itself he never knows. Since the effects of the changes in the atom over the surrounding field are known only in terms of changes in the matter in that field, and since our knowledge of changes in the atoms of which this matter is composed will be of the same indirect kind as the knowledge of our original atom, it will be seen that, so far as our knowledge of matter is concerned, we are enclosed in a vicious circle. Perambulate its circumference as we may, we never meet a bit of matter itself; we only note the effects of hypothetical bits on other hypothetical bits. We know, then, not the atom, but only the causal characteristics which the atom would have if it existed. What we are entitled to say is not "There is an atom, like a sun with planetary electrons going round it," but "The phenomena of radiation are consistent with the hypothesis that there is an atom of such a kind producing such and such effects when it changes." The atom, in short, is not a scientific fact; it is a convenient hypothesis to explain other facts. Hence it is no surprise to find that the latest developments of the atomic theory by Schrodinger treat the atom as a fiction, describing it merely in terms of the emanations that proceed from it. The atom ceases altogether to have the properties of a continuing thing; it is merely a region from which energy may radiate. Analyse this energy, and you will find yourself forced to describe it in its turn in terms of atoms of which the same may be said.

Now, matter is comprised of atoms. It follows, then, that

we do not know what matter is. Not knowing what a piece of matter is itself, we do not know any of its intrinsic properties; we do not know, therefore, that it has the intrinsic property of being different from mental phenomena, or of being able to cause them. How little, then, are we justified in making the assertion that the Materialist makes when he attributes to matter the capacity to produce the whole world of varied phenomena of which our experience makes us aware, including that experience itself.

Faced by this general agnosticism about matter, we find that there is one particular respect in which our inability to make assertions about the nature and behaviour of the atom has a special significance.

Assuming for the moment the picture of the atom as a central sun, a nucleus with planetary electrons rotating round it, with which Sir Ernest Rutherford has made us familiar; assuming, too, as on this basis we have every right to do, that changes in the atom in the course of which it absorbs or radiates energy are due to the jumping of an electron from one orbit to another, we may well ask, What makes the electron jump? We may ask, but we cannot answer. We do not know. The extent of the jump we can measure, but the cause of it we do not know. So far as our present knowledge goes, we can only infer some inherent spontaneity in the electron itself, in virtue of which it can move uncaused. It is as though science itself were to justify us in attributing to the atom a measure of free-will. Thus, in the present state of our knowledge, we are left with the hypothesis of an initiative inherent in matter, in virtue of which all the changes through which matter becomes known to us occur. The Materialist, no doubt, will insist that our increasing knowledge of physics will supply us with the cause which is at present lacking; but this is once more to make the assumption that everything in the universe is amenable to the law of cause and effect—an assumption which, as we have seen, begs the very question at issue. Even if the cause of the electron's jump were discovered, should we not then be faced with an unknown cause of that, and so on indefinitely, with an unexplained residue always evading the net of material causation?

This apparent spontaneity in the changes of the atom has a particular relevance to the modern definition of Materialism in terms of determinism rather than of material substance, of which we have already given an example from Mr. Chapman Cohen's book, "Materialism Restated." We saw reason to

doubt whether such a definition, in so far as it was not a mere tautology, did in fact succeed in disassociating Materialism from the assumption of a material substance as the fundamental stuff of the universe. Even, however, if we take the definition at its face value, and consider the essence of Materialism to be the view that every state of the universe is the determined result of the preceding state, it no longer seems possible to feel the old certainty that this is the case. We cannot predict when a change in the atom constituted by a jump on the part of one of its electrons will take place; and it can no longer be said, therefore, that, even from the fullest information about the present state of the atom and its environment, its future history can be calculated theoretically by the laws of physics. The physical world, in fact, is no longer the closed, rigidly deterministic system it was thought to be in the nineteenth century, and it seems improbable that any one state of it is completely determined by, or could have been completely deduced from, the preceding state.

There is a natural disposition of the human mind to explain everything as the inevitable unfolding of past events which roll the future before them, much as a wave will carry a cork on its crest. This disposition, responsible for theology with its notion of a universally causative God, has found renewed encouragement in the deterministic tendencies of Materialist science. Yet, if the modern criticisms of scientific method are sound, it may prove a fallacious guide. This is not to deny the efficacy of causation, but to qualify it, the qualification arising from the necessity of recognising the presence of a creative element in the universe, which, bringing to birth something new at each stage of its development, requires for its adequate description not only the conception of cause, but also that of goal or purpose which it may be conceived to be seeking to achieve. We shall return to this point later.

Here, then, with the hint of what, in spite of the Materialists, we must at present regard as a vital quality of initiative at the very heart of matter, we must leave this aspect of the subject.

(iv) *The Logical Refutation.*—The fourth consideration which I wish to urge against the Materialist view is of a logical order. This, I know, will fail to carry weight with those who, regarding logic as a mere game of words, refuse to accept the demonstration that a view is exposed to irrefutable objections as constituting an objection to the view. Even scientists are commonly too encumbered by evidence to engage in the

operations of pure reasoning, which they are, perhaps for this reason, inclined to distrust. Logic, however, is one of the oldest activities of the human mind, and has been accustomed for centuries to receive the acknowledgments of philosophers. It is proper, then, that they should be made in this little book in the shape of a brief chain of pure reasoning unspotted by fact.

If Materialism is correct, the mind, as we have seen, is part of (or a function of) the brain. Our thoughts then reflect—indeed, in the last resort they *are*—movements in the brain, and they are determined therefore by these movements. We think our thoughts, not because they are true, but because our brain passes through certain cerebral states. Truth, in fact, on this view is an inadmissible concept, since the notion of truth involves the assumption that an idea can be tested by something other than its relation to the brain—something which can convict it, for example, of being either true or erroneous. Now, if Materialism is right, our thoughts can—indeed, they must—be chemically sound, since they must reflect the workings of our brain; but they cannot be logically sound. To say of a Materialist's thought that it is logically correct would be like affirming of a gland or a nerve cell that it was logically correct. Hence, if Materialism is right, our thoughts cannot be true. Now, the theory of Materialism is itself a structure of thought; consequently it follows that what it asserts cannot be true. Hence Materialism is not true.

(4) *The Universe as Mental.*

The view that only mind is real, and that matter is an illusion, known as Idealism, has been on the whole the dominating view of philosophers. The arguments in its favour and the difficulties which it has to meet belong to the history of philosophy, and, as they are largely of a technical character, I do not propose to deal with them here.

Idealism assumes a number of different forms which belong broadly to one or other of two main types. The universe is conceived either as a collection of independent spiritual units, or as a single all-embracing spiritual unity. The first view leads, in my opinion (which I cannot here defend), to Solipsism or the belief that the individual's psychic states are the only entities in the universe. This view is not an attractive one. Even the most misanthropic philosophers have not wished to think that they were alone in the universe, since a world in which there were no people to dislike would afford no occasion

for the exercise of misanthropy. Hence Idealist theories of the second type consist largely of different attempts to escape from the conclusions of Solipsism. The usual mode of escape is to denounce as an illusion the appearance of many different things which the world undoubtedly presents, and to show that the universe reveals itself to philosophic analysis as a fundamental all-embracing unity. This unity is variously conceived—by Hegel as a structure of thought, by Bergson and Schopenhauer as an *élan vital* or dynamic will, by the man in the street as a single personal Creator. Views of this kind seem to me to be mistaken for the following reasons.

Either plurality—that is to say, the appearance of many things—is real or it is not. If it is real, then the universe is not a fundamental unity, but contains a number of ultimate and ultimately different things. If it is not, then the error we make in thinking it real is a real error. There is no doubt that we think there are many different things in the world; and if, in fact, there are not, then we are making a real mistake about the world in thinking that there are, since, if it were unreal, it would not be a mistake to think there were many things, and there would therefore be many things. Error is thus real and a part of reality. Furthermore, since reality contains error, reality must, if it is a unity, be error through and through, and nothing but error. This view is not, so far as I know, entertained by any philosopher; yet the only alternative to it seems to be to hold that reality is not a unity.

That reality must contain the germ either of plurality or of the false appearance of plurality—that is, of error—within itself seems, indeed, on reflection to be obvious. For nothing can exist which is not in some sense grounded in reality. Even if we say that error and plurality—or, translating into theological terms, pain and evil—are not given initially, but developed subsequently, nevertheless reality must have been qualified initially by the potentiality for their development. It must have been, that is to say, fundamentally and from the beginning, such as to bring to birth either diversity or error; in other words, it is not and never was a simple unity. But, if reality is not a complete unity, it cannot be either all God or all thought.

Monism, or the belief that the universe is or contains one thing only, appears in a somewhat different form in those writers who, like Bergson and Schopenhauer, affirm the existence of a single, all-pervading stream of life, of which all the apparent multiplicity of existences, the solid static objects

extended in space, the phenomena of art and music, and the individual consciousness of the ordinary man are so many different aspects.

But again we must ask : How did these apparently different aspects arise ? If there is nothing in the universe but the stream, then they must have been generated by the stream out of itself, in which case we are compelled, as before, to think of the stream as initially qualified by the potentiality for such development, since it is clear that a perfectly homogeneous flow could not of its own volition become diversified, unless it carried with it and in it the seeds from which the differences developed. If, however, we say the differences are unreal, then for "stream of life carrying the potentiality for real differences," we must read "stream of life carrying the potentiality for real error."

But suppose we take the metaphor of a river seriously. What follows ? Rivers do not split up of their own accord ; they are divided and dispersed when they meet with obstruction. A line of rocks breaks the river's flow, and splits it into a myriad separate streams. Given the possibility of unity in the world which takes the form of a homogeneous flow, plurality can occur, and occur only when there is something besides the initial unity to break up and diversify the unity ; it can be imposed from without, although it cannot be generated from within. The many things which the universe undoubtedly appears to contain point, in other words, to a fundamental dualism, to the existence of at least ¹ two separate principles, each of them ultimate, from the interaction and opposition between which the diverse phenomena of the world around us take their origin. The two principles are a homogeneous force or stream of life and a world of static, obstructive matter.

Having reached this point, we may now proceed to a positive statement of our position.

¹ In the last Section we shall introduce a third principle, namely that of value.

II

The Development of Life

(1) *Life and Matter.*

THE universe, we say, is not and cannot be interpreted in terms of one fundamental principle, and one only. Two principles at least are required to account for the phenomena of plurality and diversity.

Further, matter, though real, is not exclusively so. The facts of biology and psychology evade description in purely material terms, and matter itself seems, if the physicists be right, to be infected with spontaneity. We are committed, then, to the introduction into our universe of a non-material principle of life, which, interacting with and, in a sense to be considered later, manifesting itself in matter, gives rise to the phenomena we call living organisms. Taking the hint suggested at the conclusion of the preceding section, we shall think of this vital principle in the likeness of a river, which, meeting the obstruction of a material universe, is diversified by it into an infinite number of separate streams. The simile must not, however, be pressed, for, unlike the waters of the river which remain outside the rocks which break them, we must think of the stream of life as entering ¹ into the matter which opposes its course. A living organism, then, is composed of two separate principles: it consists of a material substratum animated by a current of life which enters into and pervades this substratum, much as an electric current will run along a wire.

At this point some low muttering sounds by which our ears have for some time past been assailed will no longer be ignored. Provoked by the announcement of a fundamental dualism, they have been growing momentarily more indignant until, at my description of the individual as a current of life animating a clod of matter, they have broken out into a storm of protest. I infer that there are some lions in the path, and their hostile attitude can no longer be ignored. Before proceeding further

¹ The use of spatial metaphors in this connection, although life, being non-material, does not occupy space, is misleading but inevitable.

I must deal with them as best I can, selecting for special attention the two most formidable.

(i) *The Origin of Life*.—Listening intently to the growls of indignation emanating from the first, I interpret them somewhat as follows : “ You are assuming far too much. Matter I can swallow, and, were I a Deist—which, thank Heaven, I am not—I could swallow life. The world, I should say, was created by God, who breathed life into it. Both matter and life own, therefore, a common source in the creativeness of God. But you, it seems, have no God ? Whence, then, does your life arise ? Was there a time when the world was lifeless ? If there was, life would appear to have come out of nothing, unless we are to suppose that it developed out of matter. But this belief you expressly repudiate as Materialistic.”

I do not propose to answer these questions, at least not all of them. Why should I ? We must start with something, something whose genesis, from the very fact that we start with it, we cannot explain. The religious man insists that something or somebody must have created the world, and starts with God. If I inquire whence God arose, he tells me not to ask silly questions ! God, he explains, is eternal ; His existence a mystery which we cannot hope to understand. We start, then, with God, and we don't ask questions about Him.

The Materialist starts with matter. If I ask him whence his matter arose, his resentment is not less than the Deist's. Matter, he asserts, is given, and, even though he lays himself open to the celebrated retort that having acclaimed the law of cause and effect as all-potent in the workings of the universe, he denies its efficacy to account for its beginning, we nevertheless concede him his mystery, knowing that an initial mystery is necessary for all of us. Whatever it is that you start with, the mystery remains, since by the very fact that you *start* with it you are debarred from explaining its appearance.

Now, I choose to start with two things, life and matter, and when asked how they came there I claim from the Deist and the Materialist the indulgence which I have just accorded to them. Admittedly I have two unexplained causes instead of one ; but, when it comes to dealing in mysteries, two are no more mysterious than one. And why, after all, should the universe consist only of one kind of thing ? To postulate a fundamental unity is no doubt a natural tendency of the human mind ; we feel, at least some of us do, that there must be something simple and single at the back of things ; but this

is no reason why the universe should be such as to conform to our instinctive feelings about it. If, therefore, the evidence points to two fundamental entities rather than to one, we have no justification for disregarding it, or prescribing to the universe an artificial unity in order that it may conform to our canons of intellectual simplicity.

And it is precisely because, as I shall try to show, it squares with the evidence of our complicated experience, while at the same time releasing our lives from the grip of an iron determinism on the one hand and from the caprice of an omnipotent and incalculable Deity on the other, that I am advocating this dual hypothesis. That a theory should justify our instinctive belief in free-will is not, it is true, a guarantee of its truth, nor a sufficient reason for its acceptance; but, if it does do so, it were churlish not to feel grateful.

Let us recapitulate the position to which the preceding argument has brought us. Life exists—it is obvious; moreover, it cannot, we affirm, be completely resolved into or described in terms of matter and the emanations from matter. Two possibilities arise. Either life was present in the particles of matter from the first, or it was smuggled into the material universe at a particular point of time. In favour of the first hypothesis is the fact that nowhere is life *known to exist* except in association with matter.¹ It is possible—it may even be probable—that matter nowhere exists except in association with life. The present state of our knowledge does not permit us definitely to affirm that this is so; but there are strong indications in favour of the view that the distinction between organic and inorganic matter is an unreal one. All the attempts which have been made in the past—and they have been numerous—to erect a barrier between the living and the non-living have broken down. Many of these attempts were undertaken in the interests of the theology. Men wished to believe that they had souls which would go to Heaven, and that in this respect they differed from jelly-fish which probably, and rocks which certainly, would not, and so they affirmed a radical difference between themselves and the scarcely animate world of jelly-fish and the completely inanimate world of rocks. Science, however, failed to discover an organ corresponding to the soul, and a fresh criterion of differentiation was required.

¹ I omit the possible bearing of evidence derived from psychical research, not because I wish to discredit it or think it fraudulent, but because its implications are at present too uncertain to justify us in basing any hypothesis upon them.

There was the attempt to distinguish between things which moved of their own volition and those which did not, between those which had the power to reproduce themselves and those which had not, between those which absorbed nourishment to build up fresh tissue and those which did not.

That none of these suggested criteria of differentiation are in the last resort satisfactory modern research has plainly shown. On the positive side the gulf between the non-living and the living is continually closing, as science tells us more about the behaviour of both. Sir Jagadas Bose has shown that even metals respond to stimuli, are subject to fatigue and react to poisons, in a manner different in degree but not in kind from the behaviour of organisms generally regarded as living; and the same may be said of so-called inorganic chemical systems, especially in a colloidal¹ state. Thus those who maintain a radical distinction between living and non-living matter are fighting a manifestly losing battle, being forced to abandon position after position as one after another the qualities which were thought to be the exclusive properties of living creatures are discovered to exist in embryo in apparently non-living matter.

Not only are we unable to say where the living organism begins and dead matter ends, but within the living organism itself we are equally at a loss to determine where the spirit, which is living, begins, and the material body, of which the living spirit makes use, ends. The more we understand about the living organism the more intimately bound up do body and mind appear. The Materialist speaks of a mind which is the function of the brain; he could go further. It is not only with the brain that the mind is bound up, but with the chemical properties of the ductless glands; nay, more, with the functioning of the cells of the entire body. Let a man catch sleepy-sickness, and his moral character deteriorates; curtail the secretions from his thyroid gland, and he becomes incapable of doing simple arithmetic. Given, then, the impossibility of separating dead matter from living; given, too, the impossibility within the organism of separating mind from body, it seems a fair inference that life exists only in association with matter.

A fair inference, but not a necessary one. Of all life that we know it is true; but are we justified in arguing from life

¹ For example, a silicic acid gel behaves quite differently according to whether it has been previously exposed to a high or a low concentration of water vapour.

that we know to life that we do not, or in saying that, because all matter is living (if it is), therefore life is exhausted in the material organisms that exhibit it? From the assertion, that all A is associated with B, it does not follow that all B is associated with A; nor, if we bear in mind the conclusions arrived at in the preceding pages, is it an inference that we shall be justified in making. For it is, I think, a fact that the view that life was inherent in the particles of matter from the beginning, with the corollary that wherever there is life there is matter—and, vice versa, wherever matter life—contradicts these conclusions. Why, it may be asked, if these two entities be, as we have urged, really distinct, should there be this universal relation between them—a relation such that, wherever there is one, there also is the other?

Two answers are possible. The first invokes the long arm of coincidence; it just happens, it says, that, wherever there is life, there also does there happen to be matter. About this fact there is no significance; it is merely an accident, though an accident indefinitely repeated. This answer is possible, but scarcely conceivable; nor can we, without open confession of failure, build our universe upon an infinite number of miracles. The other and the rational answer would proceed to explain the universal association of life and matter by postulating some kind of necessary connection between them—the sort of connection which is involved in the assertion that life is an emanation from matter, or matter a product of life. But a necessary connection of this kind is possible only on the assumption that matter and life are not really different, that one is, in fact, the source of the other, or that both are the expressions of some more ultimate principle. Yet this is precisely the assumption which, for reasons given in the preceding pages, we have seen fit to reject. Matter and life, we have asserted, are two distinct and ultimately irreducible principles; neither is the source of the other, and neither can be resolved into the other. If, then, there is no necessary connection between them, we are thrown back on the infinite series of chance coincidences to explain their universal association, if it is, in fact, universal.

Let us, therefore, turn to our second hypothesis, according to which life is a principle introduced at some particular stage into a universe which was at first purely material. Does not this hypothesis contradict the universal association between life and matter postulated above? Not at all. It may well be—we have conceded the point, and there is nothing in our

hypothesis incompatible with the assertion—that all matter is in some degree living *now*; but that does not prove that this was always the case, nor does it prove that all life is, or ever was, exhausted in living organisms with material bodies. For life, though other than matter and at one time owning no connection with the material universe, may be conceived to have succeeded in the course of its evolution in impregnating in different degrees all the material particles of which the universe is composed without exhausting itself in the process.

In favour of this hypothesis is the fact that this planet was at one time a mass of molten material, of glowing gas, upon which the existence of life, as we know it, would have been impossible. It is only when certain rather rare material conditions supervene that life begins to appear. Even to-day life is possible only within a narrow layer or stratum of the universe, a few miles thick; it is to all intents and purposes tied to the surface of the earth; it cannot penetrate more than a mile or so below that surface, nor exist more than a few miles above it. Hence many people have regarded life as a mere emanation of decaying matter. As the earth began to cool, they say, its surface solidified into a crust; and this crust, being composed of rotten or decayed matter, bred life, much as a decaying cheese will breed maggots. This is not a promising view, and it is perhaps as well that, in the course of our consideration of the philosophy of Materialism, we have seen reason to reject it. But, even if life is not a *product* of matter at a certain stage, it may still be true that life is able to enter into and make use of matter only at a certain stage; that, in short, there are only certain kinds of chemical combinations which will take the current of life, just as there are only certain kinds of metal which will take a current of electricity. Life had, therefore, to wait until the matter of which the earth is composed, developing in accordance with the laws of physics, had reached a condition suitable for its reception before it could make its appearance on the planet.

The point is of interest in connection with the researches upon which bio-chemists are engaged in connection with the production of protoplasm—that is to say, the material stuff of which living organisms are constructed. Many of the organic compounds found in living organisms, or secreted by them—such as urea, sugar, or starch—can already be manufactured in the laboratory. Hence it is said that, if we could continue the manufacture of these organic compounds until we had made a mass of protoplasm, and could subject the protoplasm to suit-

able treatment, we might expect it to exhibit the phenomena of living organisms. As to the likelihood of this development I am not competent to express an opinion. It is important, however, to emphasize the fact that its realization would in no sense be tantamount to the creation of life. What we have suggested is that the material universe, at first lifeless, in course of time reached a stage suitable for the reception of life. Now, there is obviously no reason why a stage of development which was once arrived at by natural means in the past should not be effected by human agency in the future. Yet, even so, it is not life that would be manufactured by chemists, but only the material which is capable of receiving it. To identify the manufacture of synthetic protoplasm, which began to behave like a living creature, with the creation of life would be like saying that the builder who constructed a house had created the tenants who proceeded to occupy it.

If we adopt the suggestion that life enters into and animates matter at a certain stage in the history of its development, it will necessarily follow that life existed prior to its appearance in the material forms of living organisms.

Thus we have silenced our first lion at the cost of committing ourselves to the company of a force or principle of life, which is more than the sum-total of living organisms, and which, existing independently of matter, enters into matter at a definite stage of material development in order, we must presume, to further its purposes.

(ii) *Interaction of Mind and Body*.—But to have escaped our first lion is not enough. For here is a second brute standing right across our path; his mane is erect, his aspect threatening, and his accents, at once querulous and indignant, may be interpreted somewhat as follows: "Life, you assert, is one thing, matter another; also, you say, they interact, and, making use of a manifestly inappropriate metaphor, you speak of life as entering into or animating matter to produce living organisms. Yet how can this thing be? The body is a piece of matter; as such it possesses the properties of matter, weight, mass, size, shape, occupancy of space, and so forth. The mind, not being material, possesses none of these properties; it has neither weight, nor mass, nor size; it does not occupy space, and it does not obey the laws of physics. How, then, if mind and matter are so different that they have not a single quality in common, can they influence one another? How, indeed, can they 'get at' one another at all? A paving-stone can crush a butterfly, because both of them possess mass and substance;

but how can it crush a wish? The length of the arm can be measured, but who can measure the inspiration which went to the composition of Beethoven's Fifth Symphony? "The protest is a formidable one, and must be treated with respect. For many the difficulty which it raises has seemed unanswerable, and has led them to embrace one or other of the forms of Monism, whether Materialistic or Idealistic, at which we have already glanced, arguing that, since interaction between mind and matter is inconceivable, it follows that there can be only matter, or, alternatively, only mind. And, granted the nineteenth-century conception of matter, it must, I think, be admitted that they are right. But, as we have already seen, the nineteenth-century conception no longer holds the field. Matter is no longer solid; it is no longer enduring; it is no longer determined by compulsive causal laws; and, more important than all, it is no longer known. And, since we do not know what the intrinsic characteristics of a piece of matter are, we can no longer assert with the old confidence that they are such as to render it incapable of entering into association with, or influencing and being influenced by, mind. Such an assertion would involve just that direct knowledge of matter and its properties that we do not possess.

But we can go further. The modern conception of matter, so far from justifying us in dismissing interaction as impossible, enables us to conceive how it might occur. We have already seen reason to discern in the spontaneity of the electron a hint of vital qualities at the heart of matter itself. What I wish now to emphasize is the confirmation which this hint receives from what our experience has to tell us of the one piece of matter of which we do have direct knowledge. So far as matter in general is concerned, our knowledge of it is, as we have said, confined to the effects produced by the changes which occur in it upon its environment. This environment is itself material, and our knowledge of it is, therefore, similarly indirect. But there is one piece of matter to which we have a more direct access. When a light wave travelling from an object to ourselves causes us to see the object, we must suppose, unless we are to countenance a preposterous physical discontinuity, that at every point between the object and our eyes something is happening which is specially connected with the object. Reaching the eyeball, the light wave causes a disturbance which passes along the optic nerve to the brain. Here it causes a further disturbance, about which we know very little; but, since any lesion between the eye and the brain prevents

us from seeing the object, we can only suppose that it is this disturbance, the last event in the chain of physical happenings that started in the form of a light wave from the object, which is responsible for the occurrence of the psychological event which happens whenever, as we say, we see the object. We may say, then, that, in so far as when we see an object we know anything at all external to our minds, it is this occurrence in the matter of the brain that we know. Hence the one piece of matter of which we are directly aware—aware, that is to say, otherwise than through its effects—when we “know” the external world, turns out to be the matter of our own brains. And our direct knowledge of our own brains in sense experience turns out to be not awareness of the layers of cells of which we believe the brain to be composed, but one of those *psychological* events which we call acts of consciousness. The whole of our conscious life, including the thoughts, volitions, desires, and emotions to which we give the name of mental, may, in short, be nothing more than our direct *inside* knowledge of the matter of the brain. But if our direct knowledge of the matter of which our brains are composed is to be interpreted in terms of consciousness, may we not be justified in picturing the direct knowledge of other bits of matter by themselves in similar terms, so that what appears to us, who know it only indirectly in terms of its effects on the neighbouring field, as a piece of matter may appear to itself as a conscious experiencing subject, requiring description in vital and mental rather than in material terms?

Thus future research may solve the problem of the interaction of mind and matter along the lines not of representing mind as a function of matter, but of representing matter as a function of mind, matter being merely the way in which the effects upon one another of the changes in entities which are experienced by themselves as mental appear to the external observer. I do not wish to press this suggestion, nor can I pursue it further without raising technical matters which would be inappropriate in a little work of this kind. In fact, I fear that I may have erred in this direction already. Apprehending censure on this ground, I hereby bind myself to present the positive statement of the views which I wish to advocate in the simplest possible terms, and to insist on being intelligible even at the risk of appearing superficial.

(2) *The Theory of Emergence.*

(i) *The Nature of Life.*—My guarantee of popular treatment

is not wholly free from the charge of hypocrisy; for to take credit for speaking of life in non-technical language is to make a virtue of necessity. What life is we know from our own experience of living. Consciousness is our constant companion, the inevitable accompaniment of whatever it is that we know. Yet consciousness itself—our present consciousness, that is—we cannot know, for in the act of trying to seize it and pin it down as an object of knowledge we find that it has already eluded us and slipped away into the past. We do not know the consciousness that is; we only remember the consciousness that was. But to remember the experience of the past is very different from living through that of the present.

Thus the actual process of being alive—the stream of knowing, feeling, willing acts of which our experience consists—is incapable of becoming the object of precise and definite description. Catch a cupful of a mountain stream and take it to a laboratory for analysis and research; you will reach, no doubt, a number of interesting and valuable conclusions about the nature of water and its contents, but you will not have explained—you will not have even helped us to understand—the charm of mountain streams. A better way, perhaps, is to catch them glinting in the sunlight. Life, then, as we experience it, is indescribable: knowing what it is like to be alive, we yet cannot say; we can say what life does, but not what it is.

Life, again, is unique; there is nothing like it in the universe. Now, all description involves giving an account of the thing described in terms of something else; and, if the thing in question is unique, such an account must necessarily falsify it. This is the fundamental defect of Materialist accounts of life in terms of the material instruments through which life expresses itself, such as brain and nervous tissue. In assuming that life is describable in terms of that which is not life, our consciousness of the scent of a rose in terms of the movements of grey matter which occur when we smell it, they beg the question at issue and falsify the life they set out to describe.

Life being unique, we can speak of it only in terms of metaphor. Nor should this necessity cause disquietude, provided that we remember that metaphors are not to be mistaken for literal truth. All thinking must be by analogy; it consists of translating one thing into terms of something else, and depends, as Aristotle pointed out, upon the intuitive perception of the similarity in dissimilars. It is no accident that all the great thinkers have been masters of metaphor.

Having silenced my lions and made an apology for the gross anthropomorphism with which you are about to charge my language, I propose to undertake a short essay in constructive speculation. As it proceeds, statements will be made which will seem to have no basis but that of sheer assumption. I ask the reader to have patience; the assumptions will be investigated, and, if possible, justified, before the book is finished. But I cannot say everything at once, and I must begin somewhere.

In a world of matter, then, we have postulated a force or principle of life which, entering into matter in order to form living organisms, is nevertheless more than the sum-total of organisms which at any one moment are living. These living organisms we are proposing to regard in the light of instruments or weapons created by life for the furtherance of what we are provisionally agreeing to call life's purpose. Varying our metaphor, we may conceive of the individual as a current of life temporarily separated from the main stream, and associated with matter as the result of life's instinctive drive to express itself. In either event individuality is not an end in itself, but a means to an end beyond itself. Once that end is achieved, the manifestation of life in matter, which results in individuality, may be expected to cease. If and when this consummation is reached, there will be no more living organisms; there will be only life. Thus individuality is a means to an end which transcends it. Meanwhile the current of life, segregated in its material environment, performs as individual a function which is, as I shall try to show, necessary to life's evolution. For the temporarily segregated current of life, which constitutes the essential reality of the individual organism, makes use of the matter of which the individual's body is composed in the interests of life as a whole, using the complicated mechanism of the body as its medium of expression, much as a driver will make use of the mechanism of his car. So far from material causation being universal, vital events will on this view precede and determine bodily events, the mind playing upon the brain, as the fingers of a skilled musician play upon the keys of the piano.

(ii) *Life as Creative*.—What we have said involves the conception of life as creative. What does creative mean? Clearly the making of something out of nothing? If what is created somehow existed before, whether in embryo or in germ, then there is no creation; there is merely a rearrangement of what was there already. Many people, including most

Materialists, believe that everything in the universe has always existed, as it were, in an incapsulated form, waiting to develop and become manifest, like the ingredients of a capsule or a seidlitz powder before it is dissolved in water. This may be true so far as dead matter is concerned, but it is, I am convinced, profoundly untrue of life; and if untrue of life, untrue also of living matter.

To illustrate the point let us consider the nature of the qualities or powers exhibited by living creatures—for example, their power of knowledge or understanding. An engineer knows how to build a bridge; a mathematician understands the differential calculus. Either this knowledge and this understanding are new in the sense that there was a time when no mind possessed them, or they are not. If they are not, then they existed in some form when the earth was populated by amoebas. But this seems absurd; to suppose that the knowledge of the differential calculus existed *in vacuo*, as it were, when our planet was lifeless, still more absurd. But if there was a time when this knowledge was not, then it has developed out of nothing; it is, that is to say, really new.

Similarly with living matter. The matter of which a living body is composed, beginning as a microscopic speck of protoplasm, ends as a many-millions colony of living cells. These cells are highly organized, and specialized for the performance of different functions. Some are marshalled to carry on the work of the nervous system; others to form the engines we call muscles; others, again, serve the comparatively lowly purpose of bone-levers. Instruments of incredible delicacy, the eye and the ear, are evolved; yet the whole complex mechanism of a living human body is developed from a particle of living matter smaller than the finest pin-head. Now, either these complex cells and organs were present in the pin-head to begin with, or they were not. If they were not, then once again they have literally been created, for, in saying that there was a time when the living tissue of, say, a human eye was not present in the universe, we are saying that this living tissue, when it appeared, came out of nothing.

But how can something come out of nothing? Ultimately we cannot tell; ultimately you may, if you like, call it a mystery, though the genesis of our own thoughts and emotions in every-day experience provides us with the key. It is this process of creation, a process which is going on everywhere all the time, for which the modern theory of evolution seeks to make provision under the name of "emergence."

What precisely does the word signify? Let us suppose that we combine the two elements, oxygen and hydrogen, in a certain proportion with the result that we produce water. Now, water exhibits certain characteristics, which are not the characteristics either of hydrogen or of oxygen; what is more, nobody who was acquainted merely with oxygen and hydrogen and had never experienced water could have deduced from the most careful inspection of these elements, taken separately, that the result of their combination would be water. In other words, some of the characteristics of water are new, in the sense that they are not present in and could not be deduced from an examination of either of its constituents. Of these characteristics of water we say that they are emergent, meaning by this that we cannot give a complete account of them in terms of the ingredients of which water is compounded. The human body, again, is composed of a number of different constituents such as brain and blood and nerves and flesh. But to take the requisite number of constituents of the right sort and collect them together is not to produce a human body, but merely a heap of flesh, bones, and so forth. For, in addition to the right quantities of the right constituents, the body is a particular form of their arrangement. When, that is to say, the constituents are arranged in a certain way there emerges a new entity which is something over and above the sum by addition of the constituent parts, and the whole entity, the human body, is more than its parts, because it exhibits qualities which were not present in any of the parts, and which nobody who had seen only the component parts could have predicted as likely to result from their combination. A lung or a heart taken by itself is not alive, and a disembodied intelligence which had seen only lungs and hearts would not know what being alive meant. But bodies, which are hearts plus lungs plus other things, are alive, and this quality of livingness is an emerged quality in bodies, just as the quality of wetness is an emerged quality in water, because it is not present in any of the parts which are brought together to make the whole in which it appears.

When, therefore, we say that the development of life proceeds by emergence, we mean that it consists in the continual throwing up of new qualities which were not present in any of the antecedents from which the entity possessing the qualities sprang. The evolution of living organisms is indeed nothing but the incessant appearance in the universe of new qualities, new powers, new activities, new attributes of knowledge and

skill for which there is no antecedent in experience and no manifest promise in the germ itself. Hence the appearance of variations in species, which, as we have seen, presents an insurmountable difficulty to the Materialist view of evolution, is merely a particular and rather sensational case of a process which is going on all the time. Life, then, proceeds by the development of novelties; it is by definition that which is always bringing to birth what is new.

Nor need we limit the application of this conception to living organisms. Water, we said, was an emergent upon the combination of hydrogen and oxygen; and the development of novelties, that is to say, of qualities in compounds not present in the constituents seems equally to be a characteristic of the material world. The comparatively simple structure of the atom becomes the unit for the molecule; the molecule for the crystal; the complex of molecules for the cell; the complex of cells for the living organism. At every stage of development there is creative novelty. Nor should this continuity of characteristics between vital and material development cause surprise. Refusing to identify life with matter or to derive them from a common origin, we have yet seen reason to affirm continuity between so-called living and non-living matter. To draw a line of demarcation between what is alive and what is dead is, we have seen, impossible; and we have advanced the suggestion that all matter is now in some degree alive, or, as I should prefer to say, infected with life. Moreover, our brief survey of recent atomic theory led us to suspect the presence of vital characteristics at the very heart of matter itself. The electron jumps we know not how or why, and it seems probable that the laws of physics will be found ultimately inadequate to account even for the behaviour of matter. Everywhere, it seems, there is spontaneity, everywhere creativity, and it may well be that the particular form of development which we are ascribing to living phenomena, a development which consists in the continual bringing to birth of what is new, is characteristic also of the material world, in so far as that world is in some degree living.

(iii) *What Emergence Involves.*—Before taking leave of the doctrine of emergence let us see to what precisely it commits us. First, we are saying that when certain factors are combined there may be more in their product than there was in the factors. This is to assert that something can come out of nothing—it is, indeed, precisely this that the notion of creativity involves—and is, therefore, to contradict the laws

of arithmetic. It is also to deny the exclusive efficacy of causation. The belief in the exclusive efficacy of causation, a belief which is at the root of Materialism, holds that a complete account of an entity can always be given in terms of its antecedent conditions. Given the conditions, the entity must be what it is, if only because it is and contains, and can be and can contain, no more than is already given in the conditions. "When we are able to give a complete description of these conditions," says Mr. Cohen, to whose re-statement of Materialism I have already referred, "we have stated all it is possible for us to know"! About what? Apparently about that which follows from the conditions, for a little later we find him identifying an effect with the sum-total of the factors whose synthesis produces it. "The effect," he says, "does not follow the combination" (of the causes or factors which brought it about); "it is coincident with it. The effect is the registration of the combination." In other words, to give a complete account of an entity all we have to do is to describe the conditions from which it can be shown to have originated, and the account will be complete because ultimately the entity is no more than the sum-total of the conditions from which it originated. Water is no more than the hydrogen and oxygen which are its factors, a symphony than the sum-total of the vibrations of the atmosphere into which it can be resolved. And if we point out that water is wet and that hydrogen and oxygen are not, that a symphony has æsthetic qualities but the vibrations in the atmosphere have not, the answer is . . . but I don't know what the answer is. For I mention this doctrine of causation not because I want to refute it—indeed, it carries its own refutation in the statement of it—but because it serves to bring out in the clearest possible way the distinction between the Materialist theory of evolution and the creative theory of emergence which I am advocating. For the former there is nothing new under the sun: everything that develops is completely contained in the factors from which it develops, and is simply the combination of those factors. Change is, therefore, merely re-arrangement of what is already given; the knowledge of the differential calculus was present in the universe, presumably upon this planet (since those by whom it is possessed are merely particular forms of arrangement of the material of which the planet is composed) before life appeared, and the ideas which go to the making of this book were somehow already present in my mind, or rather in my brain, when I was six months old. For the latter, in addition to the changes

in the arrangement of material particles which physics studies, there are changes of a different sort which are peculiar to living organisms. These changes result in the continuous emergence of what was not there before, so that at any given moment in the development of a living organism the organism is literally more than it was at any preceding moment. The process of evolution consists, therefore, in the emergence of ever higher levels of vital development; and, if I am asked what is meant by "*higher levels*" of life, I am content for the present to say: Life possessed of greater powers and endowed with richer content.

Now, our inability to give a complete account of that which emerges in terms of cause enables—indeed, it compels—us to introduce the conception of purpose. For, failing to find our explanation of a thing by reference to that from which it developed, we have no alternative but to look for the goal it may be conceived to be seeking to achieve. It is in life's urge to reach the fullest development of which it is capable, to come, as it were, to its full stature, that we shall find the warrant for attributing purposiveness to the changes through which it passes.

(3) *Life as Purposive.*

Life, then, is purposive. To what precisely does this assertion commit us? Certainly not to the view that life, as it first appears in the material universe, is imbued with a clear consciousness of its ultimate goal, a deliberate intention to reach it, and a full recognition of the steps to be taken and the phases to be passed through in order that it may be reached. The jelly-fish and the amœba are, it is obvious, not purposive in this sense; it is only by courtesy that they can be called purposive at all.

Life, then, I would conceive to be at first a mere instinctive thrust or urge potentially rather than actually purposive, blindly seeking to objectify itself in matter in order to achieve ends of which it is ignorant or only dimly aware. Thereafter the quality of purposiveness emerges as a particular expression of that enhanced consciousness, a special function of those heightened faculties which life achieves in the course of its development. Just as higher levels of life emerge, so does the knowledge that they are higher, and that they are merely a stage in a process which involves the emergence of levels that are higher yet. To say that life is purposive implies, then, first, that life at any given stage of development is conscious that

it has reached that stage, and, secondly, that a further stage is envisaged beyond. Implying this, it implies at first no more than this. Of most of us it is still true to say that we only vaguely know what we would like to become; and our conception of our own highest self, our ideal as we like to call it, is realized by the simple process of slightly extending and ennobling those qualities in ourselves of which we are proud, and eliminating those of which we are ashamed. It is, in other words, merely a refined and glorified version of our present. To some, as I shall try to show, the purpose of life means more than this; but they are as yet few, and the conception of a more ultimate goal comes to them but rarely and uncertainly.

We are to think of life, then, as a force or principle, at first unconscious or possessing only the latent germs of consciousness, seeking to realize through individuals, not only higher powers and extended faculties, but a more conscious knowledge of the use to which its powers and faculties may be put. The purpose, in short, grows clearer as the powers needed for its realization grow greater.

But the process envisaged is not inevitable, nor are we to think of life as knowing from the beginning what it has to do and how it is to do it. On the contrary, it is fallible and limited, and proceeds by the method of trial and error. Living organisms are the instruments which it creates in the effort to rise above itself; but they are far from being perfect instruments, and, as we shall see, thwart as often as they further the principle which finds temporary expression in them. Not only does life make imperfect instruments, but its control of them is also imperfect. Moreover, those who are fitted to advance its purpose at a given level may, like the Mesozoic reptiles, be unfitted to carry it forward once that level is achieved. The path of evolution is littered with the *débris* of life's discarded experiments, and we have no reason to suppose that our own success has been such as to justify the perpetuation of the human race through eternity. On the contrary, all the evidence goes to show that we are merely a temporary phase of life's manifestation, relative to the achievement of its purpose at a given stage of evolution, and liable, once that stage has been left behind, to be superseded and sent to join the mastodon and the megatherium on the evolutionary scrap-heap with as little compunction as we now discard our suits of cast-off clothing. One does not, after all, keep one's weapons indefinitely when they have done their job.

(4) *The Continuity of Life.*

(i) *The Barrier of Matter.*—But, if evolution proceeds by jumps, there is a gradual gathering of forces before the jump is made. That each living organism is a manifestation of life at a new level may be true; but it is true only because of the efforts made by its predecessors at the old.

We are led, then, to conceive of life as accumulating at each level the material which facilitates its emergence at the next. It is this conception which we must now consider. In doing so, we attempt a partial answer to a question which will have already suggested itself: "Why should life objectify itself in matter, even if it could?" Any answer to this question must necessarily be the child of guess-work clothed in the language of metaphor. Several suggest themselves which are complementary rather than alternative. We may say that in a material universe life had to become incarnate in matter before it could develop, if only because matter was the medium in and with which it had to work. Or we may think of matter in the light of a barrier, a vast obstructive bulk of chaos and deadness, interposing between life and some non-material goal that lies beyond.¹ Dimly sensing this goal and seeking what it senses, life finds matter barring its path. To pass beyond it, life must first pass through it. Accordingly it enters into matter, and, moulding the material of the physical world into the instruments best fitted to serve its purpose at each succeeding level of its progress, manifests itself in all the infinite variety of living organisms.

But if matter is a barrier, opposing the progress of life and constraining its activities within a material mould, it is not for that reason to be regarded merely in the light of an impediment. For constriction and limitation may not be without a salutary effect on what is confined. To limit is to impel what is limited to overcome the limitation; to constrict is to stimulate the energies of what is constricted, forcing it to develop a readiness in contrivance and to achieve a concentration of purpose for which the incentive and ability would otherwise have been lacking. A river never flows so strongly as when, confined within the narrow banks of a gorge, it meets and overcomes the obstacles of a rocky bed.

We would suggest, then, that in opposing and constricting life matter performs, and performs of necessity, the function of a whetstone, compelling life to enlarge its powers and sharpen

¹ We shall develop this conception in the final Section.

its faculties, in order to transcend the limitations that it imposes. The enlarged powers and sharpened faculties acquired in one generation appear in the form of innate characteristics in the next, and these innate characteristics are the new qualities whose emergence betokens life's advance.

How is this result achieved? Life, we say, is a dynamic, purposive force, of which the individual is a temporary manifestation. The thrust and pulse of life appear in the individual in the form of a continuous series of wants, and the pain of want spurs him to activity designed to satisfy the want. If, as Schopenhauer pointed out, wanting or desiring is the essence of life, effort in the endeavour to satisfy desire is its law. Hence our lives are of necessity lives of endeavour and struggle, which we are impelled to undertake in order that we may achieve the ends which we consciously or unconsciously desire. Biologists recognize this when they tell us of the struggle for existence; but there is no reason to suppose that effort and struggle cease when the purely physical needs, which they were first designed to satisfy, are automatically supplied. Although we no longer fight one another with tooth and claw for the available food supply, we still struggle over wages and prices; although our efforts are no longer confined exclusively to the physical plane, the urge of life still finds expression in the effort to create a business, to paint a picture, to master the forces of nature, or to solve the problem of the universe. Creatures who feel no need to make efforts are no longer serviceable to life, which, in consequence, feels no further need for them. It is for this reason that those of us who by some chance of birth or circumstance are removed from the immediate incentive to effort and struggle—aristocrats, for example, or lap-dogs—degenerate and die out.

Now, it is precisely through struggle, which we have seen to be the inevitable accompaniment of life, that we evolve and advance. Birds grew wings because they strove to fly; our remote ancestors, who lost their tails and achieved a precarious eminence on two legs instead of proceeding naturally on four, were spurred by an unconscious desire to walk. This desire produced efforts involving an increased performance of certain bodily activities, and a growing neglect of others, with the result that they came gradually through countless generations to transform their bodies in the direction instinctively desired. It was by the same process of effort and experiment that the human race developed and refined its mental powers, with the result that the mind of the civilized man to-day transcends

that of the savage, just as the mind of the savage transcends that of the ape.

(ii) *The Inheritance of Acquired Characteristics*.—We are affirming, then, that life is continuous from generation to generation; yet in the act of incorporating the continuity of life into our system we find ourselves committed to the doctrine of the inheritance of acquired characteristics. This, as those acquainted with biology will be the first to recognize, is likely to prove an embarrassment. While no scientific issue has aroused more controversy, the bulk of expert opinion is to-day, as it has always been, hostile to the belief that acquired characteristics can be transmitted. That the issue is crucial for our theory is, nevertheless, obvious, and it must be faced. By acquired characteristics we mean those that an individual has won for himself during his life-time, as opposed to those which he has obtained from his parents as part of his initial inheritance. The possession of a white skin or blue eyes is an inherited character; the ability to ride a bicycle or to control one's temper is an acquired character; it is, that is to say, an acquisition gained by the individual during the process of living. Now, if the gains of one generation cannot be handed on to the next, then it is clear that the notion of plan or purpose in evolution and of a cumulative progressive advance in realization of that purpose must be given up. The new developments which life may achieve in the individuals of one generation will not be transmitted to the next and perpetuated for the permanent enrichment of life as a whole, but will be lost at the death of the individuals who exhibit them, as though they had never been. Life on this basis resolves itself into a mere succession of generations, exhibiting variations which are the result of chance and making acquisitions which are won only to be lost; it is not an ordered advance in which each generation rises on the shoulders of its predecessors.

The controversy over the inheritance of acquired characteristics recalls the names of Butler, Darwin, and Weismann. Butler, contending for life's continuity and progressive advance, was represented at the time as a poor fool profaning with his audacious feet ground prudently left untrodden by the scientific angels, with nothing but his schoolboy impudence to arm him against the weight of authority he set himself to challenge. To-day the contestants are more evenly matched. We have grown accustomed to the idea that the scientist, supreme within his own sphere, may be a short-sighted owl outside it, and the reader to sympathize with Butler's

indictment of the unimaginative timidity which caused his celebrated adversaries to shut their eyes to the plainest implications of their own discoveries.

The main points at issue may be briefly recapitulated as follows. "Acquired characteristics are not transmitted," said the Neo-Darwinians, "because (1) if you cut off the tails of mice the tails of their offspring are as long as ever. We have tried it and we know. (2) The offspring develops from the germ cell. This, as Weismann has proved, is screened from all influences that can affect the body of the parent. Therefore, no modification that the parent's body acquires can cause any corresponding modification in the germ cell; therefore it cannot be passed on to the offspring."

As to (1), "your experiments," said Butler, "are puerile. Nobody contends that an acquired characteristic can be transmitted in one generation, or even in half-a-dozen. It may quite well be the case that it is only after a length of time which far transcends the brief period studied by biology that a characteristic acquired successively by the members of many generations succeeds in establishing itself. Besides, the characteristic has to be one which the species *wants*; it must be biologically advantageous. Life has no motive to acquire a pointless mutilation such as you have inflicted on the tailless mice."

As to (2) (and here, with the advantage of living thirty years later, I am speaking for Butler), subsequent research has shown that the processes involved in the formation of the new embryo are far more complicated than Weismann supposed. The question at issue is no longer that of the susceptibility to outside influences of a comparatively homogeneous unit germ cell, but of the arrangements of packets of chemicals along the chromosome. We do not know enough about the laws governing this arrangement to justify us in asserting that they are *not* affected by a characteristic acquired during the lifetime of the parents. In any event, the assumption that the offspring's inheritance from the parent is confined to and exhausted by the material of the germ cell is one that begs the question at issue. A skilled physiologist can detect no difference between the brain of an idiot and that of a genius; yet there is obviously something present in the latter which is lacking in the former—something which, using the brain as its instrument, is yet not contained in it. Similarly, it may well be the case that in addition to the material of the germ cell there is transmitted to the child, as part of his initial inheritance, a

current of just that stream of life for whose existence I am contending—the child, in fact, from one point of view is the current—and that the quality of this vital current, unlike that of the germ cell, is radically affected by the acquisitions not of the parents merely, but of the complete line of the child's predecessors. Hence all questions relating to the actual *apparatus of inheritance*—questions, for example, of the relative degrees of importance of chromosomes, genes, germ plasm, and the rest, which biologists study—may well be irrelevant to the issue with which we are concerned.

In general, it may be pointed out there are innumerable characteristics now possessed by living creatures which were not present when the world was populated by amœbas—namely all those which we have called emergent.

These or the germs from which they have developed must have had a *first* appearance, and they must therefore have been acquired and not inherited by the first generation of living creatures in which they appeared. Reappearing in the offspring of that generation, they will do so as acquired characteristics that have been inherited. But if it is possible that acquired characteristics were inherited once, if our present possession of characteristics not present at the amœba level renders the supposition of their inheritance on this one occasion not only possible but necessary, why need we go out of our way to deny their transmission as a normal occurrence? If a thing happens once, it can happen often, and unless we are to assume that each generation develops by chance the same sort of characteristics as those which were possessed by its parents, that it is a mere coincidence that the children of Englishmen are like Englishmen and not like Chinamen, then we must conclude that inherited characteristics are inherited. Nobody, in fact, denies that they are. Yet, as we have seen, these inherited characteristics must at some time or other have been acquired.

(iii) *A Formula for Evolutionary Progress*.—Nor, in the light of the theory of emergence, should we have difficulty in accepting this conclusion. On the contrary, the facts sketched above, without positively requiring, nevertheless strongly suggest it. Life, we have seen, evolves by constantly emerging at new levels. At each level there is literally more than there was at any preceding level; in each vital product something which was not present in its constituents. Thus there is a definite jump from level to level, a definite advance from the constituents to the product. But it does not follow from this

that *anything* may emerge upon *any* combination. Because there is a jump from one level to the next, there is no reason why one level should not prepare the way for the next. On the contrary, it may well be that it is only when suitable preparation has been made that the jump can be taken, only when the members of one generation have consciously laboured through effort and struggle to acquire fresh powers of mind and body that the next is enabled to appear equipped with the old powers in the shape of new faculties. That life accumulates in one generation the material for its jump in the next, the conscious acquisitions of the parents appearing as the innate faculties of the children, is the formula upon which our theory of evolutionary progress depends.

Samuel Butler has sketched it with his usual picturesqueness, and I do not see how to improve upon his statement. How, asked Butler, does a chicken know that it must at a certain stage of its development peck its way out of the shell? How does it know, further, that it must grow a little horny tip at the front of its face in order to perform the operation? How does it not only know these things, but know them so well that it does them without thinking about them? Instinct, you will say; but instinct, after all, is only inherited knowledge, the things we do instinctively without conscious thought and effort being the things which our remote ancestors had to learn to do and to practise hard and often before they could do them with even tolerable certainty. The skill and knowledge so acquired constitute characteristics which are transmitted to future generations as instincts. Thus instinct is unconscious memory, the things we do instinctively being the things that the race has done so often in the past that we, remembering them unconsciously, do them without thinking about them in the present.

Originally, we may suppose, the species had consciously to attend to the performance of many operations, such as circulating its blood or growing its hair or nails, which we now do instinctively. The transference to the unconscious or instinctive part of ourselves of processes which once required conscious effort and attention is an evolutionary gain, since it sets free our energy and attention for the acquisition of new powers. For example, we learn by effort and practice to ride the bicycle and to do the multiplication table. If we go on learning these things for a sufficient number of generations, we shall one day come to know how to do them instinctively, with the result that children will be born to our remote descendants

with an instinctive capacity for balancing themselves on two wheels and an instinctive knowledge that seven times seven make forty-nine. We thus have a formula for progress in evolution according to what each generation knows and does instinctively more of the things which previous generations had to expend attention and energy in knowing and doing. Thus for each generation there is available a greater fund of energy and attention for the acquisition of new vital powers and faculties, which in their turn will form part of the inherited equipment of future generations. Vital progress thus consists in the transference of the conscious acquisitions of one generation to the unconscious natural endowment of the next, so that what is first acquired as a faculty ends in being inherited as an instinct. In this sense, then, acquired characteristics can be transmitted, the machinery of transference being that faculty of unconscious memory which we call instinct.

Now, we have been careful to disavow the suggestion that life as a whole is at any given moment exhausted by the sum-total of living units. We have conceived of it rather as a stream or force which, expressing itself in the countless varieties of living creatures, is over and above the sum-total of the individual currents which flow from it. We can now proceed to amplify this conception by the notion of life's continuity from generation to generation. Just as the modern theory of physics envisages a common source of radio-active energy from which each atom of energy emanates, and to which, conceivably, it returns, so, we are suggesting, each unit of vital energy, which, when associated with matter, we call a living organism, reverts at the break up of the body to a main stream or reservoir of life, enriched by the skill and knowledge, the more intense consciousness, and the enlarged powers of understanding which the individual has acquired throughout a lifetime of effort and struggle, and with these enriching the life strung from which it took its rise. If living organisms are to be regarded as life's contrivances for facilitating the process of its own evolution, it is clear that their struggles and their victories, their acquisitions of skill and of knowledge, the sharpening of their faculties and the heightening of their powers—all the changes, in short, that happen to them in their lives—are not matters indifferent to life as a whole, but have a direct bearing upon its present status and future prospects. And the conclusion at which we have arrived is that life as a whole is constantly being fertilized and developed by the acquisitions of knowledge, skill, and insight which its individual units win

for it, and appears in consequence in each successive objectification of itself in matter at a slightly higher level. I am contending, that is to say, not so much that I am the richer in vital endowment because of the efforts of my particular ancestors, though this may in some measure be true, but rather that the generation to which I belong enjoys life as a whole at a higher level and of a richer quality because of the acquisitions of all the preceding generations.

There is the further conclusion that there is something in the individual that survives death. This is not to assert that personal immortality which believers in survival are so anxious to claim. There is, so far as I can see, no reason, beyond the hopes born of our love for others and our conceit in ourselves, for supposing that anything that can be properly regarded as you or I—anything, in short, that bears the mark of individuality upon it—survives the dissolution of our bodies. To assert the contrary is to confuse what is held, unaccountably as I think, to be desirable with what is judged on the evidence to be probable. Wishes, however, though they may father thoughts, do not, unfortunately, breed evidence. But in the sense in which a current of energy may return to its source, or a temporary separated rivulet may rejoin the main stream, in that sense reabsorbed in the main reservoir of life from which we have temporarily emerged, something of us, which is nevertheless not our individuality, survives. Life is eternal, but the garments which it puts on and off are not. Nor should this occasion regret. It is only unsatisfied desires and unused energies which make men crave eternal opportunity for their use; it is only those who have wasted their talents in this life who hope to make good in another. If we have lived to the last ounce of our energy and used ourselves to the extreme of our capacity, we shall not ask for more.

(5) *The Contrivances of Life.*

(i) *A Hint of Ethics.*—From the formula just established we may infer that our success in life consists in using our energies in furtherance of the purpose for which we were created. Not to seek pleasure directly, which is to miss it, but to find it in the performance of a task or in the pursuit of an interest, in devotion to a cause or in sacrifice for an ideal—this is the practical upshot of the doctrine we are sketching. I myself, taken by myself, am at best a nervous little clod of wants and ailments. Querulous, conceited, and self-indulgent, not only do I think myself the centre of the universe, but I have an

unreasonable propensity for regarding the rest of the universe as only there for the purpose of putting me in the centre. And I suffer from a sense of disgusted wonder at the persistent refusal of the rest of the world to take me at my own valuation.

To infer from this confession an undue humility on the part of the writer is to err; for he thinks others no better than himself. Taken as individuals concentrating upon self-realization as an end, we are miserable failures. It is only when we forget ourselves in something outside ourselves, lifting ourselves up out of the selfish little pit of vanity and desire which is the self, by losing ourselves in something greater than the self, that we achieve success, and with success happiness.

The Greeks practised self-knowledge as the specific for effective living; I would substitute rather self-forgetfulness, so true is it that the only way to avoid being miserable is not to have enough leisure to wonder whether you are happy or not.

From these hints it should be possible, if not to construct a system of Ethics, at least to sketch an attitude to life. The task is an attractive one, but it cannot be undertaken here. Besides, I have attempted it elsewhere. But the possibility that it implies will suggest to the discerning mind a disquieting question. Ethics, as we have remarked above, depends upon free-will. We must be free to choose the right and to refuse the wrong, if the terms "right" and "wrong" are to retain any meaning. And in suggesting that the individual may, within limits, choose his course—that to spend himself to the last ounce of his capacity in the service of life is to make a right, to concentrate upon the direct satisfaction of the self to make a wrong choice—we have tacitly implied that this freedom is guaranteed by the theory of evolution we have put forward.

(ii) *The Possibility of Freedom.*—But is it? If the individual is an instrument of life, created for a special purpose, a contrivance to achieve an end rather than an end in himself, in what sense is he a free agent? Can an instrument act otherwise than in accordance with the will of its maker? Can it, indeed, be said to have a will of its own which is other than that of its maker? How comes it, then, that individuals are stupid and slack and reactionary; that at times they palpably move back instead of forward; that, in a word, they go wrong?

To point out that the instruments of life are not always

perfectly adapted to its purpose, though relevant, is not sufficient. Life, as we have seen, is limited and experimental; it works in an alien material, and within the limitations which matter imposes achieves the best of which it is capable. Enlarging its powers by the method we have sketched, it refines and improves its instruments, so that human beings represent life at a higher stage, and are capable of carrying it to a yet higher one, than the Mesozoic reptiles. Yet life's instruments are still imperfect, and, while life expresses itself in the material world, must remain so. All this may be granted; yet, granting it, we may ask whether these imperfections are entirely due to the experimental character of life and to the limitations imposed upon its activities by matter? All human beings are in an equal degree manifestations of life, yet the differences that they exhibit in respect of the ability and will to carry out its purposes are enormous. Can we make life responsible for all these differences? Is it really the case that, having created some of us at a higher level, it should relapse and manifest itself in others at a lower; that a force which is capable of producing Plato should go on to produce an idiot? Faced with such differences, we must ask ourselves whether the explanation of them may not lie in the fact that life is not, after all, in complete control of its individual manifestations. May it not be the case that they possess some measure of freedom in virtue of which, while it is open to them to go right, they are also free to go wrong? We may further life's purposes, it is true; but also we may thwart them. Accepting this supposition, we shall find the explanation of the difference between the good man and the bad one, between the profitable servant and the unprofitable one, at least in part, in the different uses they have made of the talents entrusted to their charge.

And for the explanation of the possibility of this individual freedom—a freedom which, I am suggesting, is not only apparent, but real—we must look, paradoxically enough, to matter. If life is literally the only thing in the universe, then, indeed, it is inexplicable; for, if life is absolute, it must exercise complete control over all its creatures. We are back here on the theological difficulty of reconciling an omnipotent God with the freedom of man. But, if life is limited, limited and constrained by the world of matter in which it is manifested, then, at least, individual freedom becomes conceivable. For we may think of matter, the medium in which life expresses itself to form a living organism, as a barrier interposing

between the main stream of life and the individual current—a barrier which confers a measure of freedom from determination by the main stream upon the individual current whose separation it effects. As, when a streamlet is diverted by a line of rocks from the main course of the parent river, its energy and flow are derived from the main river, but its direction is its own, being the result of the interaction between the current of the streamlet and the conformation of its environing banks, so, I would suggest, it is to the interposing barrier of matter that the individual owes his partial freedom from the absolute control of life; that, in other words, he escapes complete determination by life, just in so far as his existence does not constitute part of the main flow, but results from an interruption of the main flow.

The cardinal events of his career are admittedly outside his control. Pitchforked into life at birth whether he wills or no, he must accept an existence that he has not sought, in circumstances that he has not chosen. Nor may he readily lay it down. Suicide, indeed, is always open to him, and many have availed themselves of the opportunity it offers; but their number is negligible compared with those who continue to support an existence of which, as Schopenhauer convincingly demonstrated, the pains must outweigh the pleasures. And the reason why we so persistently try to make the best of an enterprise which has been imposed upon us without our consent is that the length of our lives is decided less by us than for us. The question at issue is not whether we want life, but whether life wants us. For, having created us to use us in pursuit of its purpose, life is not disposed to let us go until it has done with us. When that time comes we find ourselves, in spite of the strongest determination to live, bundled out of life as unceremoniously as we have been bundled into it. And just as the beginning and end of our own existences are matters outside our control, so are the steps which life takes to ensure our continuation in others. At the appropriate time it causes us to fall in love—that is temporarily to form the most unwarrantable estimate of the beauty, intelligence, sweetness of disposition, and general attractiveness of a member of the opposite sex; and life puts this monstrous delusion upon us in order to ensure through us the all-important business of the creation of fresh instruments for its use. Masters of our feelings, arbiters of our fate and of a reasonably sound judgment until the moment comes, we are suddenly deprived of the faculties of rational thought and independent

will, and, dazed but willing victims, are ruthlessly dropped into the arms of the partner to whom we have been allotted. Thus in the great issues of our existence—whether we shall live at all, when we shall cease to live, and whether and with whom we shall perpetuate life in others—we are not consulted.

But in other things, and especially in the use we make of the inherited faculties with which we have been endowed, it is not so. And so life has evolved a series of contrivances with a view to ensuring that, in spite of our freedom to go our own way, we shall in point of fact go life's way, by following the path along which the progress of evolution lies.

Of these perhaps the most important is the genius. With the notion that variations in species often appear abruptly in the form of "sports" or mutations, which nothing in the previous history of the species has foreshadowed—that evolution, in fact, proceeds by jumps—we are sufficiently familiar. If the "sport" establishes itself, the characteristics in respect of which it is a "sport" become diffused over the species as a whole; in other words, a new species appears. Now, what I want to suggest is that this process has not ceased merely because the centre of vital interest has shifted from the strictly biological sphere, but that the process which once succeeded in producing a creature who forsook the trees and abandoned the use of his tail, in order that he might maintain a precarious eminence on two legs, still expresses itself in the form of a more subtle process of thought, a deeper insight into morals, or a fresh conception of beauty. And to the organism in whom life first exhibits this advance, to the "sport" at the intellectual or spiritual level, we give the name of genius.

(iii) *The Significance of Genius*.—Human beings are, on our theory, composite—part life and part matter. From the latter they derive a tendency to stagnate; from the former a sense of shame which makes them wish to justify it, and dignifying their inertia with high-sounding names such as "orthodoxy," "respectability," "necessity of maintaining law and order," and so forth, to make a merit of perpetuating the beliefs, the customs, the morals, and the social arrangements of the present, rather than go to the trouble and disturbance in which the carrying out of the next evolutionary advance would involve them. And since a species which was stationary in respect of its spiritual, social, or æsthetic life would be as obstructive to the purpose of evolution as one which stood still in respect of its biological characteristics, life is under the necessity of contriving a "sport" in the shape of the original

thinker or genius to give conscious expression to its instinctive purpose. The genius is a sign-post pointing along the road which society must travel, and, from the very circumstance that he points away from things as they are, he automatically provokes the opposition of those whose interests are vested in things as they are. For there are vested interests in the ear of the community no less than in its land, and those who have already staked out their claims will naturally enough have no squatting on such valuable property. Hence the lawyers and doctors and priests and parents, the teachers of dead languages and the professors of dead gods, the class of rulers and employers and the *leaders* of the classes of slaves and workers—in a word, all those whose reputation and position depend upon the maintenance of existing practice in the sphere of action and of established dogma in that of thought, do their best to suppress the first symptoms of a change in social values. They are aided by man's natural disinclination to have their beliefs derided as conventions, their habits as laziness, and their morality as hypocrisy, with the result that each new advance is only effected in the teeth of the opposition of those in authority, backed up by the prejudices of common sense. If it is a new conception of morals, it is denounced as a vicious heterodoxy which will bring society to ruin after a period of decadence, such as that which characterized the ancient empires of the East, and its author is hounded out of the country, crucified, poisoned, or tortured as the fashion of the times may dictate. If it is a new revelation of beauty, it is boycotted as untrue to life, as inharmonious, decadent, repulsive, or of a monstrously distorted form, and the artist is starved to death in a garret in the usual way. Undeterred by his reception, the genius continues to "sport." Indeed, he cannot help himself, being not so much a free agent as the vehicle for a message that transcends him—a fountain pen through which the stream of inspiration flows to write what it will. The poet, as Landor remarked, "is not aware of all that he knows, and seems at last to know as little about it as a silkworm knows about the fineness of her thread." And since the vision of the genius represents the new level of emergence at which life is preparing to express itself, the next generation is found to embrace his ideas as vehemently as its fathers denounced them. Thus life's advance to higher levels of thought and consciousness proceeds by a succession of jumps; civilization as a whole gradually moves up to the level from which the voice of the genius crying in the wilderness was first heard, and the children

posthumously ennoble the man whom the fathers starved or crucified.

To the frequency with which this process has been repeated the history of our race bears unmistakable witness. Socrates, Giordano Bruno, Galileo, Joan of Arc, and Christ, to take a few names at random, were all tried and condemned for holding opinions which their own generation considered to be shocking, but for which the world now honours them. Recent years have seen a speeding up of the process, and men like Ibsen and Shaw have attained in their own life-time to the honour which was denied to their predecessors. I use the word "honour," but it is doubtful if these men would so regard the incorporation of their once hated doctrines into the mental stock-in-trade of the man in the street. For, once the thought of your time has moved up to the level to which you first pointed the way, you become a back number, and the new generation, seeing the world through spectacles which you have tinted for them, dismisses your most heterodox pronouncements as the harmless platitudes of a superannuated generation. Shaw merely bores the young. Thus it is the Nemesis that waits upon those who tell the truth for the first time, that after a time we think we have always known what they told us.

When the thought of the genius has been accepted and passed into the intellectual heritage of the race, its work is done. Its message delivered, it passes insensibly from the hated to the holy. To revere it becomes a point of honour. Finally it is enthroned in the lumber-room of the academic mind, whence its authority goes forth to stifle the inspiration of the future. The history of human thought is strewn with the *débris* of the ideas we have outlived. They constitute a stereotyped mould of formal belief and conventional behaviour, through which a fresh expression of life's evolving purpose in the person of a new genius is required to break. Thus the living beliefs of yesterday are petrified in the Prayer Books of to-day, and the immoralities of to-day are enshrined in the "Family Herald" of to-morrow. The conclusion is that thought proceeds by a series of continuous jolts; the genius of the present finds it embedded in a rut out of which he shakes it to settle into a new one, from which it will again be ejected by the genius of the future.

III

The Purpose of Life

THAT life is purposive, and that it expresses itself in matter to form living organisms in order to further the realization of its purpose, is the thesis that has been argued through the preceding pages. In this concluding Section I want to indicate as briefly as I can the lines upon which I consider that this purpose can most appropriately be conceived. Up to the present we have contented ourselves with the suggestion that at each level of evolution life's purpose may be identified with the urge to achieve the heightened consciousness, sharpened faculties, and extended powers which will enable it to emerge at a higher level. But this progressive achievement of higher levels or qualities of life by no means exhausts the meaning which we wish to attribute to the word "purpose," and, as we have hinted above, intimations of a more ultimate goal have already begun to appear.

(1) *The Objects of Knowledge*.—Before we can proceed to indicate its character it will be necessary to say a few words about the nature of knowledge and its objects. The mental activity which we call "knowing" (I am using the word in its widest sense to denote all the different ways in which we become aware of the world) is, we affirm, always directed upon something, this something, which is other than the activity itself, being what we call the object. When mental activity takes the form of sense perception this statement would be generally accepted. It is a condition of our having experience through our senses that there should be external objects for us to experience; and our perception of a table is, we hold, different from the table we perceive. These things are obvious; only philosophers would wish to deny them. But when we come to the activity of thinking, the position is less clear.

Let us suppose that, inhibiting sense experience as far as possible, I shut my eyes and begin to think about something. I am thinking, let us say, of Cromwell. What is the object of my thought? Clearly not a piece of matter, for Cromwell as a piece of matter no longer exists, or rather the substances of which his body was composed are now completely diffused

throughout the material universe, and it is certainly not about worms, or atoms, or bones, or ashes that I am thinking. Yet a thought about Cromwell is assuredly a thought about something. This is clear because (i) we cannot think about nothing; (ii) thinking of Cromwell is different from thinking of Charles I.; hence Cromwell must be something, if only in order that he may be different from Charles I. But, it may be said, Cromwell is a concept, a vague expression with a variety of meanings, which is ordinarily used to denote a general notion or idea, some sort of mental entity. But a mental entity must be in a mind. In whose mind? Presumably in that of the thinker. In thinking of Cromwell, therefore, I am thinking of something which exists or is happening in my own mind. This seems unlikely, because (i) the same reasoning would show that when *you* think of Cromwell *you* are thinking of something in *your* mind, from which it follows, first, that we never think of the same thing, and that the intelligible communication of ideas, not only in thinking about history, but in thinking of any kind, becomes impossible, since no one person knows what anybody else is thinking about; secondly, if all thinking minds were to pass out of existence, history would go out of existence also—not merely our thoughts about history, but the whole series of past events which history records; yet present events, such as the abolition of our minds, cannot affect past ones. (ii) Whatever arguments there are for saying that the activity of perceiving a table brings us into contact with something other than our own minds apply equally to the activity of thinking about Cromwell. The Cromwell, therefore, of whom I think is neither a piece of matter nor is he a mental entity in the mind of the thinker.

As this is not a treatise on philosophy, I cannot enter into the vexed question of who or what precisely he is. It is sufficient for my purpose to emphasize the fact that he is not a piece of matter, and to call him non-committally an object of thought. Now, the argument about Cromwell applies to whatever occupies our attention when we are engaged in thinking, as opposed to experiencing the external world by means of our senses. It applies obviously to the objects we study in logic and mathematics; it applies less obviously to history and literature; and, in so far as the activity of the scientist consists not merely in doing experiments with test tubes or collecting fossils, but in interpreting and collating the results of the experiments and drawing deductions from the fossils, it applies to the sciences. It is with objects of thought, then, and not

with the material world, that life is concerned when we are engaged in thinking.

(2) *Objects of Value* —Among objects of thought there are three which occupy a peculiar position. These are goodness, truth, and beauty. I call them objects of thought because they are neither material nor mental; moreover, like objects of thought, they are changeless. But the differences are more important than the likenesses. Our knowledge of truth, goodness, and beauty comes to us but rarely and intermittently, and takes the form not of a full and untrammelled awareness, but of vague and fleeting intimations. These objects are not known directly, but their copies or images are discerned in a material setting, where they have the power of evoking an intense and unique emotion in the mind that is aware of them, which is recognized as the most valuable emotion of which the individual is capable. Because of their ability to arouse this unique kind of emotion, we propose to designate these three objects "objects of value."

That a beautiful picture is not adequately described in terms of an arrangement of lines and colours on a piece of canvas, or a symphony as a number of vibrations of such and such frequencies in the atmosphere, the previous discussion on emergence should have made clear. But, in pointing to the obvious fact that the picture as possessing the quality which we call beautiful is more than a collection of material particles, I am asserting more than is implied in the doctrine of emergence. I am asserting that the quality of beauty which we discern in the picture belongs to it in virtue of the fact that the picture stands in a special kind of relation to the objects belonging to the world of value; and, further, that it is in virtue of the presence of this same quality as a common element of different works of art that we give them all, in spite of the differences between them, the name of "beautiful," and feel for them all the same emotion which we call "æsthetic." Works of art are different and many, but the beauty which is manifested in them is one and the same. This quality of beauty is derived from the special relation in which works of art that possess it stand to the world of value.

So much by way of statement of our position. What are our reasons for holding it? The arguments for believing in the existence of objective beauty, truth, and goodness will be partly a repetition of those used above to demonstrate the existence of objects of thought. There are, however, additional arguments in the case of objects of value based upon the

peculiar character of the judgments we make about them, which seem to imply an objective standard of reference, in terms of which the beauty, truth, or goodness of that which is being judged may be assessed. Propositions are either true or not true, pictures beautiful or not beautiful, even if we cannot tell with certainty with regard to any one of them whether it is true or beautiful or not. The well-known divergences between people's moral and æsthetic judgments, and the impossibility of deciding between them, should not blind us to the fact that they are, nevertheless, judgments about something definite and objective, just as the fact that we may all of us make different guesses as to the temperature of a room does not mean that it has not a definite temperature. In this respect moral and æsthetic judgments differ from judgments involving matters of physical taste—as, for example, whether certain gooseberries are sweet or sour which are purely subjective and merely report the variations in individual palates. Thus two conflicting judgments about the gooseberries—namely, to the effect that they are both sweet and sour—are not judgments about the intrinsic qualities possessed or not possessed by the gooseberries themselves, but about two different events—namely, the different sensations produced by the gooseberries in two different people. Hence the conflict between the judgments is not real, but apparent. But when we come to works of art we all recognize that one man's taste may be better than another's, because we feel that some works of art really *are* better than others, and that the man who prefers Bach to jazz is right in a sense in which the man who takes the opposite view is wrong. And we feel that the terms "rightness" and "wrongness" may be appropriately used, because there is an objective quality of beauty about the music of Bach which the first man perceives and the second misses. Hence to say that a man has "good taste" is to affirm that he has a faculty for perceiving the objective element of beauty which is manifested in works of art. These considerations are in the main derived from Plato. The *Symposium* gives reasons for believing that there is an objective element of beauty in the universe, while similar arguments will be found in the other *Dialogues* for the belief in the objective character of goodness and truth.

I said above that the relation of beauty to the works of art which we perceive to be beautiful is one of manifestation. The statement is controversial, and for a treatise on philosophy insufficiently precise. In any event, it needs qualification. Since, however, the matter cannot be discussed at length here

I will content myself with saying that in my view the relation may be defined as one in which the beautiful work of art imitates or reproduces in a material medium certain combinations and patterns, whether of line and colour or of sound, that exist in the world of value. This definition brings us to the function of the artist. The artist is one in whom life has emerged at a higher level than in his contemporaries. At this level he is enabled to catch occasional glimpses of the world of value, to a full knowledge of which, as I shall try to show, it is the object of life to attain. So long as his vision lasts, the artist remains rapt in contemplation, thrilled to ecstasy by the image of the world of value which has been vouchsafed to him. But the vision does not last. Life is a dynamic, changing force, an ever restless surge, which, though it may ultimately come to rest in the untrammelled contemplation of value, has not yet emerged at a stage at which such contemplation is either possible or desirable. The most that has yet been vouchsafed even to its most favoured children is a fleeting and intermittent glimpse; the veil is lifted only to be redrawn. While æsthetic contemplation lasts, we are will-less and selfless, but only for a moment. Scarcely is he assured of the unique character of what his vision reveals before the artist is caught up again into the stream of life, and pulled back into the world of need and want, of struggle and desire, to which his status as a vital unit inevitably condemns him.

And filled with longing and regret for the vision that was his, but is his no longer, he strives to embody its outlines on canvas or in stone before the memory of it shall have utterly passed away. Thus the work of art is a witness not so much to the artist's vision as to his failure to retain it. It is because he cannot hold his awareness of the real world that he makes images and copies in which his remembrance of it is embodied. In these images and copies the sensuous material, with which the patterns of the world of value are in natural objects overlaid, is stripped away, and the combinations whose significance the artist has caught are presented as clearly as the nature of the subject matter allows. For this reason, because the artist has first prepared the way and made it plain, it is easier for those of us who are not gifted with his powers of vision to see beauty in works of art than it is in natural objects. Thus art is the window through which life gets its first intimation of the nature of the world of value; its function is, to use a metaphor of Plato's, to turn the eye of the soul round to reality, by revealing the element of significant form in virtue of which the

objects of the material world show forth the patterns of the world of value which lies behind them.

(3) *Through Matter to Value.*—Apologizing for the length of this preamble, I can now proceed to a statement of my theory of the purpose of evolution. Life, as we have tried to show, appears initially in a world of matter, and infuses itself into the material of this world, in order to create living organisms. Life as expressed in these organisms is characterized by a two-fold relationship to matter. It knows or is aware of it, and it is dependent upon it. By life's knowledge of matter I mean merely that the interest and attention of earlier forms of living organisms are directed exclusively upon material objects. The attention of plants is largely concentrated upon themselves; they are aware of their own bodily needs—of the need for sustenance, for example—and of the need to reproduce themselves. Needs of this kind—the feelings, as we may call them, of the plant—can be analysed in terms of the plant's awareness of chemical changes in its own material structure. Animals, aware of their own needs, are aware also of material objects external to themselves; for example, they know other animals. But, though the scope of their awareness has widened, their attention is still directed almost exclusively upon material objects. It is probable that some animals are capable of the rudiments of thought; but, if they think, they do so rarely and intermittently, their actions being, with the exception of a few doubtful cases, adequately accounted for in terms of reaction to material stimuli. When we come to human beings there is a change. Savages, indeed, think little more than animals, and their lives are spent largely in knowing and attending to matter. But in civilized man thinking has become normal. Life, that is to say, has emerged for the first time at a level at which its attention is more or less continuously directed not upon the world of matter, but upon non-material objects of thought.

In order that we may realize how this advance has become possible, let us consider the other aspect of life's relationship to matter—namely, its dependence upon it. Life as manifested in the early forms of living organisms is almost completely at the mercy of its material setting. The mind is enslaved by the body, and by the ills that beset the body, while the organism as a whole is a plaything for the brute forces of nature. It is the sense of our helplessness before matter that has been the motive force of religion, the power of God being invented to compensate for the powerlessness of man.

